DIRECTIONS

FOR

THE TREATMENT OF PERSONS

WHO HAVE TAKEN

POISON,

AND THOSE IN

A STATE OF APPARENT DEATH;

TOGETHER WITH

THE MEANS OF DETECTING

POISONS AND ADULTERATIONS IN WINE;

ALSO,

OF DISTINGUISHING

REAL FROM APPARENT DEATH.

By M. P. ORFILA.

TRANSLATED FROM THE FRENCH

By R. H. BLACK, Surgeon.

WITH AN APPENDIX,

ON SUSPENDED ANIMATION AND THE MEANS OF PREVENTION.

Second Edition,

WITH ADDITIONS AND CORRECTIONS.

LONDON:

PRINTED FOR LONGMAN, HURST, REES, ORME, AND BROWN,

PATERNOSTER-ROW.

1820.

Printed by Strahan and Spottiswoode,
Printers-Street, London.

TO

G. C. JULIUS, Esq.

THIS TRANSLATION

IS

RESPECTFULLY INSCRIBED,

AS

HUMBLE ACKNOWLEDGMENT OF GRATITUDE

AND HIGH ESTEEM,

FOR HIS KIND FRIENDSHIP

AND PATRONAGE IN EARLY AGE;

BY

HIS MOST OBLIGED

AND GRATEFUL FRIEND,

THE TRANSLATOR.

PREFACE.

It has long been a subject of considerable regret, that the valuable information contained in the "*Traité des Poisons*," by M. Orfila, has not heretofore appeared in a more condensed form, and in popular language; since it is so greatly to be desired, that the information contained in that volume should be in the possession of every individual.

That want having now been supplied by M. Orfila himself, in a work which has received the high commendation of his contemporaries,

the Translator hopes to render some service to his own countrymen, by putting it into an English dress.

From the recitals which the newspapers daily contain, it can require no force of reasoning to prove, that numerous valuable lives may be preserved, if such knowledge be generally extended.

In the translation which is now most respectfully submitted to the public, the Translator assures them, that he has been most assiduous in preserving the literal sense of the Author; in doing this, he feels conscious of occasionally clothing his sentences in a foreign phraseology, and of his work being deficient in the decorations of style; but at the same time, he trusts he has rendered a *faithful* translation of every valuable part in language sufficiently perspicuous to be comprehended.

In the French school of medicine, numerous prescriptions yet exist, of very antique origin, when the greater the multitude of ingredients, the more sovereign was the effect expected to be produced; but many of those ingredients being uncommon in England, and, indeed, our late advance in chymical knowlege having proved, that in these heterogeneous compositions, some of the ingredients entirely neutralise others, the Translator has occasionally substituted such more simple medicines as can be generally procured, and as are approved by the London College of Physicians. Such substitutions, and an occasional condensation of matter, are the only points in which the Translator has taken the liberty of deviating from the original work.

In the elucidation of some practices which were peculiar to the

French school of medicine, the Translator has been kindly assisted by some eminent French physicians, under whom he has lately been studying; and whom he begs to accept of his warmest acknowledgments.

CONTENTS.

SECOND CLASS.

APPENDIX.

REPORT

MADE TO THE SOCIETY OF THE FACULTY OF MEDICINE OF PARIS AT ITS SITTING ON THE 14TH MAY, 1818.

The Society has commissioned Messrs. Pinel, Percy, and myself, to examine and give a report on a manuscript of M. Orfila, intitled "Succours to be given to Persons poisoned or in a State of suspended Animation, followed by appropriate Methods of detecting the various Poisons."

The object of the Author in composing this book has been to render popular the most important information contained in his "Traité des Poisons," and to indicate all that relates to the different species of suspended animation, — the succours which ought to be given to infants born without signs of life, — the marks which distinguish real from apparent death,— the treatment of burns, and the sophistication of wines.

The utility of this work appears to us too evident to render it necessary that we should expatiate upon it. All that we shall say is

that M. Orfila has endeavoured to delineate, with the greatest possible fidelity, the different diseases of which he has treated, and the means he has employed to combat them. In constantly employing terms in general use, instead of those of science, and rejecting all theory, he wishes his work to be considered as a collection merely of such precepts as ought to be followed in administering aid to persons poisoned, or in a state of suspended animation. We shall abstain from detailing the method pursued by the Author for the attainment of this object, the treatment he employs being similar to that which he has advised in his General Treatise on Poisons; a work which has justified the opinion the Institute had formed of it; as is proved by the first edition of it being all sold, and a second ready to appear.

In designating the properties of the different poisons, M. Orfila has selected those which were the most important and the easiest to ascertain, and frequently one or two of these properties suffice to discover the poison.

The simple and accurate manner in which M. Orfila has treated a subject, already very interesting of itself, has rendered the work still more useful.

This work of M. Orfila must become generally esteemed, freed as it is from scientific

terms, which are often comprehended by unprofessional persons with more difficulty than the subject-matter itself, and reduced to precepts the most simple, yet sufficient to effect the object proposed.

It is to be wished that Government would take the necessary measures to distribute it among all classes of society; and especially that it may be in the hands of medical practitioners, the clergy, and municipal officers, to whom the knowledge of the improvements which science has made of late years in the treatment of persons poisoned, or in a state of suspended animation, has now become indispensable.

(Signed) PERCY.
PINEL.
VAUQUELIN.

INTRODUCTION.

AMONG the more serious diseases, those which call for most immediate succour are, certainly, suspended animation, and the affections which arise from the different kinds of poison. The preservation of persons poisoned, or in a state of suspended animation, always depends upon the promptitude with which the antidotes are administered; whence it results, that medical men should be acquainted with the progressive improvements of science, in order to be able most effectually and without loss of time, to combat these dangerous affections.

It is of the highest importance, that the clergy, the magistracy, heads of large establishments, fathers of families, and the inhabitants of the country, should be

put in possession of all the resources of our art, so as to be capable of affording relief when the medical practitioner is at a distance, and unable to render any assistance till after the lapse of many hours. The experience of every day proves, that these accidents terminate fatally in many cases, principally from want of knowledge in those who surround persons in the state we are speaking of, at the commencement of the accident.

From this consideration, this manual is now offered to the public, freed from scientific terms, which are often more difficult to be comprehended by persons unacquainted with medicine, than the subject-matter itself. Desirous of rendering it intelligible to every reader, all that solely relates to theory, and the examination of bodies, has been purposely omitted. It will, therefore, we trust, be regarded as a useful collection of precepts necessary to be attended to in the case of persons poisoned, or in a state of suspended animation.

We have, with great care, described the manner of preparing and administering the medicines, and annexed the proper doses, and the time at which they should be given. We may, perhaps, be accused of being too minute in the detail, and of having repeated words that might have been omitted: the interest of the sufferers must plead for us in excuse. Further, we are persuaded that such of our readers as possess no knowledge of medicine, will not blame us for having indicated, with prolixity, the necessary treatment, so as to render it more fully intelligible.

We believe it will be useful, before entering into the subject at large, to give some general notion of the nature of those subjects, and of the order in which we design to treat them.

MINERAL POISONS.

The concentrated acids and alkalies, the preparations of arsenic, copper, antimony, bismuth, zinc, tin, gold, and

silver, nitre, the artificial *Barège*, and other sulphureous waters, phosphorus and sal ammoniac, are the mineral poisons we design to notice. We shall begin by detailing the effects they produce when introduced into the stomach or applied to wounds. When these effects are the same as those caused by another poison already spoken of, we shall content ourselves with indicating by this mark (§) the number of the paragraph in which they are to be found; by which means a great number of repetitions will be avoided.

Under the title of "Considerations upon the Employment of the Preparations of Copper, Mercury, &c.," we shall make known the dangers which exist in administering them without the advice of a physician; insisting particularly upon those which are poisonous when applied to wounds; and shall point out all that is necessary to be done to prevent poisoning.

In another article, entitled "Means of distinguishing the Preparations of

Copper, Arsenic, &c.," we shall give a general idea of their most important properties, and such as are easily ascertained. One or two of these properties will generally suffice to distinguish the poisonous substance ; and by the aid of these tests, the nature of the poison which may have been swallowed will be readily determined, and its effects combated with greater certainty.

Before speaking of the treatment, we shall examine, under the title of *Counter-poisons*, the substances which have been considered as such ; we shall reject those which are useless or dangerous, and advise the use of those, the efficacy of which has been proved by repeated experiments, such as *the white of egg*, *milk*, *common salt*, *vinegar*, *lemon-juice*, *soap*, *gall-nuts*, and such other substances, as may be obtained with the greatest facility.

After having examined all that relates to *counter-poisons*, we shall give, with every necessary detail, the treatment required, indicating therein the prepar-

ation and dose of the medicines to be given, and the order in which they are to follow, till the individuals enter into a state of convalescence; then, far from abandoning them, we shall guide them till their recovery is complete; persuaded, as we are, that it is of the highest importance to bestow the most assiduous care upon the convalescents, and anxious that they should not be exposed to the risk of losing the advantages derived from the medicines previously administered.

VEGETABLE POISONS.

We shall arrange these under three heads: Stimulants, Narcotics, and Acrid-narcotics. At the commencement of each section, we shall enumerate the substances comprised therein, and then speak of the effects in a general manner. The next article will explain the treatment to be adopted, in order to relieve the effects they have occasioned; so that the particular histories of cases which succeed immediately after, will have no

other object than that of making known the energy of these poisons, the dangers incurred by their improper administration, and the means of distinguishing the one from the other.

ANIMAL POISONS.

These will be ranged under several heads. We shall first treat of the effects produced by the bite of the viper, and other venomous reptiles; the sting of the scorpion, bee, wasp, gnat, spider, tarantula, &c., and then indicate the means of remedying them.

The effects of muscles and of certain fish, which have in some instances produced poisoning, will follow immediately after.

Lastly, we shall treat of canine madness, and the malignant pustule, which sometimes arises from exposure to putrid animal matter; and minutely point out the measures to be taken for opposing and preventing the ravages of these disastrous diseases.

ASPHYXIA. *

The different species of Asphyxiæ will be treated with all the minuteness which they require. We shall speak of that arising from the vapours of charcoal, lime-kilns, wine, or other liquors in a state of fermentation, from privies, and common sewers; of the suspended animation from immersion in water, hanging, want of air fit for respiration; and of that produced from exposure to excessive heat or excessive cold.

The manner of introducing air into the lungs of persons in a state of suspended animation, will be pointed out.

Under the title of "Treatment to be applied to Infants born without any signs of Life," we shall speak of the asphyxia and apoplexy of new-born children, diseases which cannot be confounded without danger, since the treatment proper for the one is highly injurious in the other.

* The state of body during life, in which the pulsation of the heart and arteries cannot be perceived.

SIGNS BY WHICH REAL MAY BE DISTINGUISHED FROM APPARENT DEATH.

In this article, we shall treat of the signs which have been regarded as demonstrative of real death; we shall show that none of them, taken singly, (except a manifest state of putrefaction,) can determine the question; and that it is necessary to consider the whole together, if we would avoid committing fatal errors.

BURNS.

We shall first treat of those which are superficial and of slight extent, and then indicate all that is necessary respecting the treatment of those which are superficial, but which extend over a large surface; and lastly, consider those which are deep and occasion ulcers of greater or less extent.

ADULTERATION OF WINES.

Under this head we shall make known first, the frauds which may occasion ac-

cident, and the means of discovering the presence of lead, alum, and too great a quantity of brandy; we shall then pass on to those sophisticated with saccharine, colouring, or astringent substances, the use of which is followed by no danger; and lastly, describe the processes, by the help of which we may detect the presence of arsenic, copper, and antimony.

Such are the objects we deem it necessary to treat of, in order to render this work useful.

ON

PERSONS POISONED

OR IN A

STATE OF SUSPENDED ANIMATION.

CLASSIFICATION OF POISONS.

All the known poisons may be ranged under the four following heads:

1st. Irritating poisons, or those which produce inflammation of the parts to which they are applied.

2d. Narcotic, or stupifying poisons.

3d. Acrid and narcotic poisons.

4th. Septic or putrefactive poisons.

FIRST CLASS.

IRRITATING POISONS, OR THOSE WHICH PRODUCE INFLAMMATION OF THE PARTS TO WHICH THEY ARE APPLIED.

THIS class includes the concentrated acids and alkalies, corrosive sublimate, and all the mercurial preparations, arsenic

and arsenical compounds, verdigris and the other salts of copper, tartar emetic, butter of antimony, and the other preparations of antimony; the oxides and salts of tin, gold, and bismuth; nitrate of silver, sal ammoniac, liver of sulphur, nitre; the salts of barytes, glass in fragments, cantharides; salts of lead, acrid plants, or their concrete juices, as colocynth (bitter apple), mezereum (spurge-olive or widow-wail), ranunculus (crows' foot), great celandine, aconite (wolf's bane or monk's hood), savin, gum gamboge, and gum euphorbium.

1. All the above poisons inflame the parts with which they are placed in contact, but in different degrees. There are some which produce so great an inflammation that they may be regarded as caustics, almost as powerful as the actual cautery. They are called corrosives or escharotics; and they evidently cause death in the same manner as burns: such are the concentrated acids and alkalies, the lunar caustic, the mezereum, &c. There are others whose caustic effects are

less intense, but which, however, cause death in a very rapid manner, because they are absorbed, mixed with the blood, carried into the circulation, destroying the vital properties of the heart, lungs, brain, and nervous system; organs so essential to the preservation of the individual, that death must be the inevitable result of an extensive injury received by them: such are arsenic, corrosive sublimate, barytes, aconite, &c.

The difference of action in the poisons of this class naturally leads us to conclude that the symptoms they give rise to, will not be always the same; consequently it is useful to establish a certain number of subdivisions, when we wish to describe accurately their effects, and especially when we are called upon to combat them.*

* A copious collection of facts relating to this class of poisons is to be found in Dr. John Johnstone's "*Essay on Mineral Poisons*," contained in his "Medical Essays and Observations." Evesham, 1795.

CONCENTRATED ACIDS.

SULPHURIC, nitric, muriatic, phosphoric, oxalic, tartaric, acetic, and citric.

Symptoms.

2. Quickly after having swallowed any of these substances, an acid, burning, and excessively disagreeable taste; acute pain in the throat, stomach, and bowels; the breath insupportably fœtid; frequent eructations; vomiting of various coloured matter, sometimes mixed with blood, producing in the mouth a great sensation of bitterness, effervescing when mixed with chalk, and reddening the tincture of turnsole or litmus; hiccup; in general copious evacuations, more or less bloody; colic, or rather pains so acute, and easily excited, that even the weight of any clothing becomes insupportable; difficulty of breathing, frequent and irregular pulse, excessive thirst. Drinking augments the pain, and what is drank is

shortly after vomited; occasional shivering; the skin, particularly of the lower extremities, appears frozen; cold and clammy sweats; vain and repeated efforts to make water, impossibility of maintaining the same position; convulsions of the face and limbs; the visage becomes pale; the intellectual faculties are rarely disordered. Frequently the inside of the mouth is covered with white and black patches, which, in falling off, excite a fatiguing cough, the voice becomes changed, and occasionally a painful eruption appears on the skin. All these symptoms are not always found in the same person. The nitric acid produces yellow spots upon the lips and skin.

Counter-Poisons or Antidotes.

3. From a number of experiments, calcined magnesia has been found to be the most effectual. An ounce of this should be mixed with a pint of water, and a glassful taken every two minutes, so as to favour vomiting, and prevent the

acid from acting. Should this not be at hand, decoction of linseed, marshmallows, or any other mucilaginous liquid, may be taken in the mean time; for the success of the treatment depends entirely upon the activity with which aid is given; the delay of a few moments may determine the fate of the sufferer. Magnesia is the chief remedy, but, in lieu of it, soap dissolved in water, (half an ounce to a pint,) or chalk and water in any dose will be found extremely useful. Glysters, prepared with the same substances, should also be given.

Treatment.

4. If, notwithstanding the employment of these means, vomiting should not take place, (which is hardly to be presumed,) the use of emetics, or other means of exciting sickness, as the finger, &c., must be abstained from. The acid being neutralised, the inflammation caused by its action is next to occupy our attention. To reduce this, cloths

steeped in a strong and slightly warm decoction of linseed or mallows, must be applied; and, should their weight be insupportable, the stomach must be frequently moistened with a sponge; and, if it can be obtained, the patient may be placed in a warm bath. If relief be not speedily obtained by these measures, twelve or fifteen leeches should be applied, and bleeding performed.

If from the application of the leeches the pain should remove from one place to another, the same number should be applied to such part also; and even upon a third change of situation, we ought not to be afraid of applying fifteen or twenty leeches more. The safety of the patient from this period depends upon the copious evacuation of blood; and the feebleness thus produced is to be considered as comparatively only a slight inconvenience.

These energetic measures will be assisted by the administration of a drink made with linseed, or mallows, or gum-water slightly sweetened. Every sort of

food, not excepting broth, is to be forbidden.

5. If there be difficulty of swallowing, and the inflammation be great, twelve or fifteen leeches should be applied to the neck.

6. Should the convulsive movements continue after the inflammation has subsided, the following should be taken: thirty drops of æther, or Hoffman's anodyne liquor, twenty drops of laudanum, four ounces of mint-water, or any other fluid: a desert spoonful to be taken every fifteen minutes. Or a decoction of three or four poppy-heads, with three ounces of sugar.

7. When the fever has nearly ceased, the patient may be allowed to take a little thin veal or chicken broth; and when convalescent, gruel, rice-milk, &c., avoiding with care all solid food, wine, and spirits, which irritate anew the stomach. Wine, regarded by many persons as proper to restore action, is, in this case, a fresh poison, which acts precisely like that, the effects of which

we have combated. It is only after three or four days that solid food, in small quantities, and of easy digestion, may be taken.

8. Let us now suppose the case extremely dangerous, and that the patient is unable to swallow, either from the teeth being closed by spasm, or from constriction of the throat; we must then have recourse to the method suggested by Boerhaave, and improved by Messrs. Dupuytren and Renault, which consists in evacuating the stomach by the use of a tube of *elastic gum.* "The tube," says M. Renault, "must be of sufficient length that the lower end may reach to the lowest part of the stomach, and of sufficient capacity to allow of the passage of soft matters, such as those half digested. A metal ferule is to be attached to the superior opening, which is to be received into the pipe of a syringe. It is then to be passed by the mouth or nostrils; and a quantity of fluid introduced to dilute, suspend, or dissolve the poison; then, on withdraw-

ing the piston, a portion of the contents of the stomach is brought up. By repeating this operation two or three times, the stomach will be well washed, the poison extracted without violence, almost without pain, and in a very short space of time. The possibility of extracting the poison, when not in large pieces, and still in the stomach, is evident to all who consider the construction and use of the common pump. When some trials upon man have proved its efficacy, the use of it will doubtless become very extensive. I have injected to the extent of eight ounces of water into the stomach of several little dogs, and have always been able to pump up the whole. Nor can its success be doubted, when it is recollected with what benefit analogous means are often used for emptying the bladder of coagulated blood."

9. Applied to the exterior parts of the body the acids are not absorbed; and the injuries they thus produce are to be treated in the manner directed for burns. (See Burns.)

Means of distinguishing Acids.

10. They change the blue colour of the tincture of litmus* or turnsole to red. SULPHURIC ACID has no odour; heated with charcoal it disengages the same smell as sulphur when burnt. NITROUS ACID, poured upon copper, effervesces, and gives rise to copious vapours of an orange colour. The more perfect acid (nitric acid) is colourless; but, poured upon copper, it has the same effect.

Concentrated muriatic acid gives off whitish vapours, and mixed with a solution of nitrate of silver, throws down a white, heavy, and curdled precipitate, which cannot be dissolved in water or nitric acid. Aqua regia, or nitro-muriatic acid, acts upon copper in the same manner as nitric acid. *Fluoric acid* corrodes glass.

* Red cabbage has been found to furnish as delicate a test for acids as litmus. The natural colour of an infusion of this plant is blue; and it is changed green by alkalies in very minute quantities, and restored to its primitive colour by acids. TRANS.

Oxalic acid heated in a tube, is almost entirely volatilized, a small portion is decomposed, and a little charcoal is left behind; a solution of the acid in distilled water, added to lime-water, causes a white precipitate, which is *not re-dissolved* by an access of oxalic acid. *Tartaric* acid is entirely decomposed by heat, and leaves much carbon; added to lime-water, it occasions a precipitate, which is *easily re-dissolved* by an excess of acid.* *Citric* acid is decomposed by heat, and *does not* precipitate lime-water, unless added in solid lumps, or when the mixture is heated.

THE ALKALIES AND ALKALINE EARTHS, POTASH, SODA, AMMONIA, AND LIME.

11. The effects of these are nearly similar to those caused by acids, (see § 2.) except that the taste of alkalies is not sour, but acrid and urinous; the matter vomited does not effervesce when

* For its effects on a solution of sulphate of potash, see the next note.

mixed with chalk, but turns the blue colour of violets green.

The *concentrated volatile alkali* acts with much greater energy than the others. Experience shows that it is even very dangerous to cause persons who have fainted to respire it too long, the vapour inflames the throat and lungs, and occasions death, as has been lately proved. It is necessary, then, in such situations, to content ourselves with passing the phial, containing the alkali, under the nose from time to time.

Antidotes.

We have found from direct experiments, that vinegar and lemon-juice are the best antidotes to the poisons comprised in this article. In a case of poisoning of this kind, give several glasses of water mixed with a spoonful of vinegar or lemon-juice, or in defect of these, simple water in such quantities as to cause vomiting. Emetics, or other irritating means, are to be avoided. If

this be not effectual, the treatment § 4. is to be followed.

Means of distinguishing the Alkalies.

13. The alkalies dissolved in pure water turn syrup of violets green. The volatile alkali is readily discovered by its strong odour. Potash is precipitated of a light yellow by muriate of platina. Soda, on the contrary, remains transparent.* Neither the one nor the other is changed by sulphuric or carbonic acids. From lime-water a white precipitate is thrown down by adding car-

* In his account of these tests the author has been somewhat inaccurate: for both potash and soda form triple salts with the muriate of platina. The yellow precipitate, by which the alkalies may be distinguished from each other, appears when nitro-muriate of platina is dropped into a solution of sulphate of *potash:* while no such precipitate is formed with the solution of sulphate of *soda*. Another criterion is afforded by the tartaric acid, which throws down a number of minute crystals when dropped into a solution of sulphate of potash, while it produces no such effect with sulphate of soda.

bonic acid or any of the carbonates, and it is not visibly affected by the addition of sulphuric acid.*

CORROSIVE SUBLIMATE, AND OTHER MERCURIAL PREPARATIONS, ARSENICAL PREPARATIONS, VERDIGRIS AND OTHER SALTS OF COPPER, BUTTER OF ANTIMONY AND OTHER ANTIMONIAL PREPARATIONS, SALTS OF TIN, BISMUTH, GOLD, AND SILVER.

14. BEFORE speaking of each of these in particular, we deem it necessary to state their effects in a general manner; as they are nearly the same.

The taste of these poisons is acrid metallic, more or less resembling that of ink, less burning than acids and alkalies. The patient complains in general of a constriction of the throat, pain in the back part of the mouth, in the stomach and intestines; desire to vomit, followed by vomiting with more or less violence.

* Turmeric is a very delicate test for alkalies, and on the whole, perhaps, the best. The natural colour of a spirituous or watery infusion is yellow, which is changed to a brick or orange red by alkalies. TRANS.

The matter vomited is of various colours, often mixed with blood; it does not effervesce when thrown upon the ground, or mixed with chalk; it never changes the colour of violets green; and when it reddens the tincture of litmus or red-cabbage, it does so in a very slight degree. The bowels are occasionally constipated, sometimes relaxed, and then the evacuations are often bloody.

To these alarming symptoms, are joined frequent and fœtid eructations; hiccup, difficulty of respiration, approaching to suffocation; the pulse becomes small, hard, and accelerated, and in certain cases, it may be said to vibrate under the finger like a piece of catgut. We seldom find it unequal and intermittent, that is, having not the same interval between each pulsation. An inextinguishable thirst, difficulty of making water, cramps, the extremities of an icy coldness, horrible convulsions, general decay of strength, the features of the face changed, delirium; such are the symptoms which announce approaching death, unless energetic mea-

sures for relief be speedily put in practice. In some circumstances, the intellectual faculties are preserved unchanged to the last moment.

MERCURIAL PREPARATIONS.

Corrosive Sublimate, Red Oxide of Mercury, Æthiops Mineral, Cinnabar or Vermilion, Turbeth Mineral, Nitrate of Mercury, Mercurial Ointment.

Effects of Mercurial Preparations.

(See § 14.)*

Considerations upon the Employment of Mercurial Preparations.

15. The greater number of mercurial preparations become most valuable remedies in the hands of a skilful physician; but as quacks take advantage of the credulity of the public, and administer

* In addition to the effects which mercury produces in common with other deleterious metals, its peculiar operation on the mouth and salivary glands should not be lost sight of, although the author has omitted to mention them.

them without the least caution, it is necessary to mark the danger to which their dupes are exposed.

It is rare that corrosive sublimate, in doses of even a grain, fails in producing unpleasant symptoms; and it is the more certain of doing so, in proportion as the dose is larger. Placed upon cancers, wounds, tumours, &c. with the design of effecting a cure, it acts as a violent poison, and occasions death in the course of ten, fifteen, twenty, or thirty hours, as we have several times seen; whence it follows, that it should never be employed in these cases. Mercurial ointment frequently rubbed upon the head or other parts of the body to destroy vermin, is not without danger. Experience proves, that when the ointment is used in too great a quantity, the rubbing too long continued, or the skin very delicate, many of the symptoms of poisoning are produced.

Counter-Poisons, or Antidotes.

16. We have proved by incontestible experiments that the white of egg beat up with cold water is the best counter-poison to corrosive sublimate and the other mercurial preparations. In defect of this, milk may be used with great success. The alkalies and alkaline earths, the preparations of sulphur, bark, and charcoal, have been recommended, but they are always useless and often dangerous; whence it follows that they are excluded from the treatment we are about to recommend.

Treatment.

The whites of twelve or fifteen eggs should be beat up and mixed with two pints of cold water, and a glass-full taken every two or three minutes, so as to favour vomiting. If the number indicated be not at hand, as many as are should be used in the mean time, while others are sought after. The yolks may also be used without inconvenience. In defect of eggs,

milk, gum-water, decoction of linseed, of mallows, sugar and water, or simple water, should be taken in abundance.* If after taking the number of eggs prescribed, the symptoms be not removed, the same should be repeated: these should be prepared before-hand so as to admit of acting with the greater promptitude. The patient is then to be treated as § 4., except that vomiting should be excited by irritating the throat with the fingers or a feather.

Means of distinguishing Mercurial Preparations.

18. All the mercurial preparations heated to redness in a glass tube with potash are decomposed, and the metal, which is seen sticking to the edge, becomes quickly volatilized. Corrosive sub-

* By this means the *energy of the sublimate will be weakened*, and the stomach filled with liquids. The mere fulness of the stomach will produce vomiting, and consequently the evacuation of the poison. See note to paragraph, § 61. Trans.

limate is white, and may be dissolved in water; potash added to this solution causes a light-yellow precipitate, and ammonia a white precipitate.*

The Red Oxide may be dissolved in muriatic acid, and is thereby changed into corrosive sublimate. The *Cinnabar* or *Vermilion* is insoluble in water and muriatic acid. The *Mercurial Ointment* boiled in water is decomposed; the lard is melted, and the mercury deposited.

* A very small quantity of a dilute solution of subcarbonate of potash, (salt of tartar,) such as a single drop, added to a solution of corrosive sublimate, will produce a white precipitate; but, on a still further addition of alkali, an orange-coloured sediment will be formed. On the addition of lime-water to the solution of corrosive sublimate, a precipitate of an orange-yellow colour will instantly appear. It should also be remarked in contradistinction to arsenic, that sulphuretted water throws down from a solution of corrosive sublimate a dark-coloured sediment, which, when dried and strongly heated, is wholly volatilized, without any odour of arsenic.

ARSENICAL PREPARATIONS.

White Arsenic, Arseniate of Soda, Ammonia, and Potash, Orpiment, Realgar, Fly-poison, Arsenical Paste, or Caustic of Justamond.

(For their *Effects*, see § 14.)

Considerations on the Employment of Arsenical Preparations.

19. Surgeons have long been in the habit of using arsenical caustics in cases of cancer; experience, however, proves that when injudiciously used they may cause death in twenty-four or forty-eight hours. The greatest precaution is therefore necessary in the employment of these preparations. Swallowed even in extremely minute doses, compounds of arsenic are energetic poisons, which do not cause death by the inflammation they excite in the stomach and intestines, as is generally supposed, but because they are absorbed, and destroy the vital properties of the heart. Frequently this

organ is inflamed and ulcerated. These facts being admitted, can we flatter ourselves with obtaining any permanent advantage from the use of arsenic in intermittent fevers, &c., as some medical men have thought, who have administered this medicine at different times? We believe it is dangerous to continue the use of arsenic if the disease be not cured by three or four doses, and even these should be very small, and employed with extreme precaution. In fact we not only incur the risk of giving rise to alarming symptoms shortly after the administration of the remedy; but also of disposing the patient eventually to a disease of the heart.

Treatment.

The best treatment consists in causing a large quantity of sugar and water, of warm or cold water, of decoction of linseed or mallows to be swallowed; by this means the stomach is filled, vomiting ex-

cited, and the poison thereby ejected. A drink composed of equal quantities of lime-water * and sugar and water may also be given. Theriaca, oil, gall-nuts, the bark of the pine, liver of sulphur, vinegar, the pomegranate, and Peruvian bark, suggested by some, ought not to be employed, because they are useless, and often dangerous.

When the principal symptoms are subdued, the treatment directed § 7. is to be followed; but if, on the contrary, in spite of the measures directed above, the symptoms should increase; if the pains in the bowels become violent, and convulsions take place, leeches must be applied to the abdomen, and blood-letting performed. In a word, the directions in § 4. must be attended to and followed up with energy.

* Lime-water may be made by boiling a quarter of an ounce of good quick-lime in two quarts of water for five or six minutes. The liquid should then be strained through a cloth.

Means of distinguishing Arsenical Preparations. *

21. White Arsenic (deutoxide of arsenic) is of a white colour, like sugar, but differs considerably therefrom, being much heavier. It is volatilized, and diffuses a smell like garlic when placed on hot iron. It is not dissolved by cold water; and lastly, it becomes of a *very fine green*, when put into a solution of the blue ammoniacal sulphate of copper. *Arsenic acid* is white, and also gives out a smell of garlic when placed on hot iron or burning coals; it is easily dissolved in water, and changes its colour to a fine blue when mixed with the ammoniacal sulphate of copper.

Orpiment is yellow; heated to redness with potash, it diffuses the vapours of

* The first of these preparations is a natural product, and is the metal oxygenated, in a slight degree. It is also called arsenious acid. *Arsenic acid* is the metal fully oxygenated, and is always a product of art. Trans.

arsenic, which smell like garlic. Realgar is *red*, and does the same as orpiment when mixed with potash and heated. There is a powder sold to destroy vermin. This is the black oxide of * arsenic: it gives off an odour of garlic when heated, and becomes green when left for some hours in a solution of the blue ammoniacal sulphate of copper.†

* Arsenic in the first degree of oxygenation.

† The most delicate and effectual method of ascertaining the presence of arsenic is that invented by Dr. Marcet, and of which an account was given by Dr. Roget, in a paper containing the history of a remarkable case of recovery from the poisonous effects of that metal, in the 2d volume of the Medico-Chirurgical Transactions. It consists in the following process. Let the fluid suspected to contain arsenic be filtered: let the end of a glass rod, wetted with a solution of pure ammonia, be brought into contact with this fluid; and let a clean rod, similarly wetted with a solution of nitrate of silver, be brought into contact with the mixture. If the minutest quantity of arsenic be present, a precipitate of a bright yellow colour, inclining to orange, will appear at the point of contact, and will readily subside to the bottom of the vessel. In their inquiries respecting the limit of minuteness in

Blue Copperas, or Sulphate of Copper; the Muriate, Nitrate, and Crystallized Acetate of Copper; the Sub-acetate, or Artificial

---

the quantity of arsenic discoverable by this test, Dr. Marcet and Dr. Roget found, that by applying it to a small quantity of the solution highly diluted, a distinctly yellow precipitate was exhibited by one 50,000th of a grain of arsenic.

It has been since found by Dr. Marcet, that any ambiguity arising from the presence of muriatic acid, either alone or in combination, may be prevented by adding to the suspected fluid, previously filtered, first, a little dilute nitric acid, and afterwards nitrate of silver, till it shall cease to produce any precipitate. The addition of ammonia to the fluid will then instantly produce the yellow precipitate in its characteristic form.

Although the test of silver may afford unquestionable indications as to the presence or absence of arsenic; yet, in cases of juridical inquiry, the concurrence of other tests, and in particular that of sulphate of copper with potash, by which arsenic is precipitated in the form of Scheele's green pigment, is highly desirable. (See Medico-Chirurgical Transactions, vol. ii. p. 155; iii. p. 342; and vi. p. 663.)

Verdigris; the Sub-carbonate, or Natural Verdigris; the Oxide of Copper (the Rust which forms on Copper exposed to the Air), Ammoniacal Oxide, Hydro-chlorate (Muriate) of Copper and Ammonia.

(For their *Effects*, see § 14.)

Considerations upon the Employment of the Preparations of Copper.

22. All the preparations above indicated are poisonous, when taken into the stomach, even in small doses; they may, however, be applied externally without any other result than local inflammation. Natural Verdigris, which is observed upon pieces of copper money, or on brass cocks, may be put in water without communicating to it any noxious quality, because it will not dissolve; but if water has remained some time upon this substance, then a portion of it being swallowed causes symptoms of poison. It is, therefore, prudent never to drink liquids which have been kept in vessels covered with the green powder of which we speak. *Artificial verdigris* is easily dis-

solved in water; hence water which has been some time in contact with it, is equally poisonous with the solid matter itself. Too great precautions cannot be taken to prevent its formation in kitchen utensils; those *perfectly tinned* offer no danger, whatever may be prepared in them; but wine, vinegar, oil, fat, and many other substances, when put into those *badly tinned* quickly cause the formation of verdigris, which, mixed with food, gives rise to serious accidents. The quantity produced is very considerable, when the substances just mentioned are allowed to cool in copper vessels; it is therefore essentially necessary whenever a copper vessel, badly tinned, is used, to empty it while the contents are still boiling. Several cases of death have occurred from eating sallad dressed with vinegar which had been kept in copper vessels.*

* On this subject, see Ramsay in the Medical Observations and Inquiries, vol. ii. p. 146, and Dr. Percival in the Medical Transactions, vol. iii. p. 80.; also Yeats in Duncan's Medical Annals for 1802, p. 394.

Counter-Poisons, or Antidotes.

23. It results, from our experiments, that white of eggs is the best. Sugar, which has been regarded by several as such, may be useful, but it is not a counter-poison. Liver of sulphur, the alkalies, gall-nuts, Peruvian bark, charcoal, &c. also consdiered as counter-poisons, are useless, often dangerous, and ought therefore to be discarded.

Treatment.

A person who has swallowed verdigris, or any salt of copper, is to be treated after the manner directed in the case of corrosive sublimate. See § 17.

Means of distinguishing the Preparations of Copper.

25. The salts of copper dissolved in water, are for the most part of a blue or green colour. The Prussiate of potash causes a reddish-brown precipitate. Metallic iron and phosphorus decompose them immediately, and the copper in a metallic form is precipitated. *Artificial*

verdigris does not altogether dissolve in cold water; boiled in water, it gives a blue liquor and a deep-brown powder. Heated to redness in a crucible, it is decomposed and metallic copper is found at the bottom.*

ANTIMONIAL PREPARATIONS.

Emetic Tartar, Butter of Antimony, Kermes Mineral, Golden Sulphuret of Antimony, Submuriate of Antimony, Flowers of Antimony, Diaphoretic Antimony, Glass of Antimony (Crocus Metallorum.)

Their Effects.

Tartar emetic, kermes, diaphoretic antimony, &c. which are frequently used

* The most delicate test of the presence of copper in any fluid, is a solution of pure ammonia, which imparts to it a beautiful blue colour. If the solution suspected to contain copper be very dilute, it should be concentrated by evaporation; and if the liquor contain a considerable excess of acid, like that used to preserve pickles, as much of the alkali must be added as is more than sufficient to saturate the acid.

by medical men with the greatest success, may become dangerous, even in a small dose, if not speedily vomited. The symptoms to which they give rise have already been described in a general manner, § 14. It may, however, be remarked, that they occasion more particularly excessive vomiting, copious intestinal evacuations, great difficulty of respiration, and often so great a constriction of the throat, that the patient is unable to swallow; violent cramps in the extremities; a sort of intoxication, and a faintness more or less considerable.

Considerations on the Employment of Antimonial Preparations.

26. These preparations are often inconsiderately employed, because they are not considered as dangerous. Experience, however, proves, that a few grains of emetic tartar may be the occasion of death if not vomited; an extreme depression and feebleness have been known to arise from a single grain, which had

occasioned no evacuation. Sometimes, on the contrary, it excites so great a degree of vomiting, that it becomes necessary to stop this symptom; this occurs principally among infants. It follows, that it is highly improper to take this medicine without the advice of a physician.

Mixed with grease or other substances, tartar emetic may occasion death, even when employed externally as an irritant.

Butter of antimony, though used with success externally in cases of bite from mad animals, ought never to be introduced into the stomach, as it causes a high degree of inflammation, of which death is shortly the issue.

Treatment.

23. Should there be great vomiting with cramp in the stomach, abundant supplies of sugar and water, or simple water, must be administered. If the vomiting continues after the poison may be supposed to have been ejected, and the pain is augmented, a grain of opium

may be given, and repeated at an interval of a quarter of an hour for two or three times, if the symptoms are not allayed. In defect of opium, give an ounce of syrup of poppies, or the decoction of three or four poppy heads. In cases where the symptoms continue or increase, twelve or fifteen leeches may be applied to the abdomen, and also to the throat, if there be a great difficulty of swallowing. If the individual who has taken the antimonial preparation does not vomit, and yet suffers from the other symptoms, several glasses of sugar and water should be taken. If, in spite of this, vomiting do not occur, the following should be given at repeated doses: four or five gall-nuts in two quarts of water; let them be boiled together for ten minutes, and then strained. Experience has proved that gall-nuts are to be preferred to any other astringent; but in default of these, two ounces of Peruvian bark, or the bark of oak or willow may be employed. Ipecacuanha, and white or blue vitriol, ought not to be given with the view of exciting

vomiting, as, by increasing the inflammation, they aggravate the disease. If, notwithstanding the use of these means, the symptoms continue, the treatment, § 4., must be had recourse to.

Means proper to ascertain the different Preparations of Antimony.

By heating all these preparations to redness in a crucible, we obtain a metallic button, easily to be known, first, by its whitish-blue colour; secondly, by the property it has, when heated with nitric acid, of giving a white powder soluble in muriatic acid. Sulphurous acid, added to this solution, throws down an orange-coloured precipitate, and water a white precipitate. Tartar emetic is white: placed upon burning coals, it becomes black, and leaves metallic antimony; it is soluble in water, and the solution is not changed by distilled water: sulphuric acid occasions an orange precipitate, and gall-nuts a whitish-grey.

Kermes is of a deep brownish-red

colour, but changes to whitish-yellow when heated with potash dissolved in water. The golden sulphuret does the same when heated with potash; but then it is naturally of an orange-colour.

Butter of antimony is a dark fluid; mixed with water it gives rise to a white precipitate.

The other salts in solution are precipitated white by water, orange or red by sulphuric acid and the hydro-sulphates. The oxides are soluble in muriatic acid, and the salt thereby formed is known in the manner we have just spoken of.

PREPARATIONS OF TIN, BISMUTH, GOLD, AND ZINC, MURIATE OF TIN, THE GREY OXIDE, NITRATE OF BISMUTH; SUB-NITRATE (OXIDE) OF BISMUTH, MURIATE OF GOLD, OXIDE (FLOWERS) OF ZINC, WHITE VITRIOL (SULPHATE OF ZINC.)

(For their general *Effects*, see § 14.)

Considerations upon their Employment.

30. THE preparations of tin are poison-

nus, and ought not to be confounded with common kitchen salt, as lately occurred at a dyer's where the muriate of tin is used as a mordant. Metallic tin is not at all noxious.

The sub-nitrate of bismuth *, which is often used to whiten the skin, has the double inconvenience of preventing perspiration, and of giving rise to chronic diseases, such as rheumatism, nervous pains, &c. Zinc is employed with success in making baths and other vessels; but ought not to be used in the construction of kitchen utensils; for experience proves, that water, the weakest vegetable acids, butter, and several salts dissolve it; so that aliment prepared in vessels, in the composition of which zinc is employed, may occasion violent purging, vomiting, and other ill effects, especially in delicate persons.

* The sub-nitrate of bismuth turns the skin black if exposed to sulphuretted hydrogen gas, as the fumes of Harrowgate and Tunbridge-wells water. TRANS.

All the salts of zinc occasion more or less vomiting.

Treatment.

31. MILK is the best counter-poison to the salts of tin, and of this several glasses-full are to be given; or, in defect of milk, warm or cold water, to excite vomiting. As for the rest, if the symptoms become worse, the directions § 4., and following, must be attended to. Poisoning from bismuth, gold, and zinc, is to be treated in the same manner as that produced by arsenic. See § 20.

Means to distinguish these Preparations.

32. *THE salts of tin* are *not* precipitated by distilled water; but potash causes a white, and the hydro-sulphates a yellow or chocolate precipitate. The *salts of bismuth* are precipitated of a white colour by distilled water, and of a black, by the hydro-sulphates. *Salts of gold* are yellow, and are precipitated of a black colour by green vitriol. *Salts of zinc*

of a white, by potash and the hydro-sulphates.

PREPARATIONS OF SILVER.

Nitrate of Silver, and Fulminating Silver.

(*Effects.* See § 14.)

33. NITRATE of silver, which appears to have been employed with success in epilepsy, is highly poisonous. Applied externally, however, its action is confined to the spot; we therefore, doubt, whether surgery will ever discover a better caustic than nitrate of silver.

Treatment.

34. MURIATE of soda (common kitchen salt) is the best antidote to this poison. A solution of a large spoonful in two pints of water should be made; and several glasses of this salt-water taken. Vomiting will take place, and the symptoms subside. If they should continue, the means indicated, § 4., must be had recourse to.

Properties of Nitrate of Silver.

35. *First*, HEATED to redness, the metal is reduced. *Secondly*, Dissolved in water, and mixed with a solution of muriate of soda, a white precipitate is thrown down. Phosphate of soda occasions a yellow, and chromate of potash a red precipitate.*

NITRE.

Effects.

36. NITRE has been considered by many as not poisonous; yet, that it is so, even when applied to wounds, is proved by experience. It gives rise to obstinate vomiting, which is often bloody, and a high degree of inflammation of the

* The precipitate by chromate of potash is reddish-brown when the liquids are mixed hot; purplish-red, when they are mixed cold; and carmine red when the chromate of potash contains an excess of acid. It becomes brown when exposed to the light, and is soluble in nitric acid. VAUQUELIN, Annales de Chimie, lxx. 70.

stomach; the consequent symptoms are more or less like those described § 14. We ought particularly to notice, that it affects the nervous system, and often occasions a sort of intoxication, palsy, convulsions, and other nervous diseases.*

Treatment.

The same as that advised for arsenic is to be followed, except that the lime-water must be suppressed. See § 20.

Properties.

38. It is highly necessary to distinguish nitre from Glauber's salt, with which it has been confounded. Placed upon burning coals, it crackles and gives a fine white flame; on the contrary, Glauber's salt melts, swells, and becomes opake. Mixed with sulphuric acid, it throws off white vapours; nothing

* The medical reader is referred to a very interesting paper on the effects of a large dose of nitre in the Edinburgh Medical Journal, No. 53, by Mr. Butler. Trans.

similar to this is observed in the case of Glauber's salt.

SAL AMMONIAC

39. Is poisonous when introduced into the stomach, or applied in large quantities to wounds. It occasions vomiting, convulsions, pain in the bowels, great change in the features of the face and death.

Treatment.

40. VOMITING is to be excited by several glasses of sugar and water, or water, irritating the throat with the fingers or a feather; the nervous symptoms are then to be combated by the antispasmodic mixture, § 6. If the pain of the stomach be great, twelve or fifteen leeches may be applied, and the treatment, § 4., pursued.

Properties.

41. PLACED upon live coals, it is volatilized, and gives a white vapour; tritur-

ated with quick-lime, it exhales the odour of volatile alkali; dissolved in water, and mixed with nitrate of silver, it occasions a heavy white precipitate.*

LIVER OF SULPHUR.

12. LIVER of sulphur, which is sometimes employed to form *Barege* and other artificial sulphureous baths, far from being a counter-poison to lead, arsenic, &c., as many still believe, is itself a violent poison. For a long time past, we have proved this fact by experiments upon animals; and unfortunately the shocking accident which occurred lately in the case of Madame la Comtesse * * * * furnished us with an incontestible proof of its deadly action. Having swallowed by mistake a portion which was intended for the preparation of a bath, she expired in the course of a few minutes. Two or three ounces may be used for a bath,

* This latter property, however, it possesses in common with many other salts.

without any danger; but the twentieth part of this quantity swallowed, may occasion grievous accidents, and even death. The effects are nearly similar to those of nitre, but much more violent. See § 36.

Treatment.

43. Mix two spoonsful of vinegar or lemon-juice in a glassful of water, and let several of these doses be taken. When, by this means, vomiting is occasioned, and the poison decomposed, twelve or fifteen leeches should be applied to the stomach and bowels. For the rest of the treatment, § 4. is to be consulted.

Properties.

44. Liver of sulphur is solid, of a greenish-yellow colour; mixed with vinegar and water, it disengages an insupportable odour like rotten eggs.

Barytes.

Barytes, Carbonate and Muriate.

Effects.

45. These preparations are extremely poisonous. When introduced into the stomach, or applied to wounds, they are rapidly absorbed, carried into the circulation, and occasion vomiting, convulsions, palsy, pains in the stomach, hiccup, and great change of the features. It is highly necessary that considerable caution should be used in the administration of the muriate as a medicine; and it is equally essential that druggists and others should not confound it with Glauber's salt.

Treatment.

46. Several glasses of a solution of Epsom or Glauber's salt should be given, in the proportion of half an ounce of salt to a wine-quart of water. Experience proves that there is no better antidote

for the preparations of barytes. In place of these salts, hard well-water may be administered with advantage. When we have by this means excited vomiting, and expelled or decomposed the poison, and the principal symptoms are relieved, sugar and water, or any other softening drink, may be taken; but should the disease make any progress, the treatment indicated § 4. must be followed.

Properties.

47. All the preparations of barytes mixed with well-water, or water having Glauber's or Epsom salts, in solution, give a white precipitate, which is insoluble in water, or diluted nitric acid. Sulphate of soda (Glauber's salt) effects no such change in these fluids; it is therefore impossible to confound them. Barytes dissolved in water changes syrup of violets green.*

* This happens only with the pure barytes. The carbonate of barytes, which is the usual form in which it is employed as a poison for rats, is best

PHOSPHORUS.

48. PHOSPHORUS introduced into the stomach in small pieces, is poisonous, but it is much more so when dissolved in oil, æther, &c. It always gives rise to the same symptoms as the mineral acids which we have already mentioned; whence it follows that its effects are to be combated in the same manner.

CANTHARIDES.

49. APPLIED to the skin, or introduced into the stomach, cantharides often give rise to serious accidents, which may be followed by death. The symptoms of their having been taken are — extremely disagreeable odour, acrid taste, burning heat in the stomach, and other parts; frequent vomiting, the materials vomited being often tinged with blood; copious

---

discovered by dissolving it in muriatic acid, and adding sulphuric acid, or sulphate of soda, which produce an insoluble precipitate.

evacuations, more or less bloody; priapism to an excessive degree, and very painful; great heat in the bladder, difficulty of making water; urine often bloody, sometimes totally suppressed; frequent and hard pulse. In some circumstances it is impossible to swallow; the jaws are closed; at length frightful convulsions, general rigidity of the limbs, delirium, and death succeed. This faithful catalogue of the symptoms which follow the taking of cantharides, shows what dangers may ensue from their employment with a view to excite the organs of generation, enfeebled by age, diseases, or more frequently by debauchery.

Treatment.

50. A LARGE glassful of oil is to be taken to favour vomiting; or instead of this, several glasses of milk, sugar and water, or water only; or decoctions of linseed or mallows; and then according to the symptoms, the treatment, § 4., is to be followed. Independently of these,

means, one or other of the liquids above mentioned should be injected into the bladder, to prevent or remedy the inflammation. If, in spite of these measures, the difficulty of voiding continues, the legs and thighs should be rubbed with two ounces of oil, in which a quarter of an ounce of camphor has been dissolved. Eight or ten grains of camphor may also be given internally; this may be mixed with fluids by means of the yolk of an egg.

If the symptoms are the effect of the external use of cantharides, vomiting is not to be excited; but the patient should be placed in a warm-bath, and a quarter of a pint of sugar and water should be given every five minutes; the frictions advised above are to be employed; and if there be great pain in the bladder or stomach, we must not hesitate to apply twelve or fifteen leeches to the seat of the pain, and to bathe the parts with cloths steeped in a decoction of linseed or mallows.

Properties.

51. The powder, even when it has passed through a silk sieve, is of a mixed colour of green and grey, and offers many points of a fine green. It has an acrid and nauseous odour; placed upon hot coals it throws off a fetid odour similar to burnt horn, and leaves a portion of charcoal as residue.

GLASS AND ENAMEL.

52. These, in fine powder, may be swallowed without danger; but, if they are in sharp pointed pieces, they produce the same inconvenience as any other pointed bodies, namely, that of tearing and inflaming the membranes of the stomach. In cases of this kind, a large quantity of beans, potatoes, cabbage, or crumb of bread, must be given; by which means, the stomach is filled and the glass enveloped: then two or three grains of emetic are to be taken, so that vomiting may be excited and the glass

rejected. Milk in abundance is to follow, and glysters may be given. The stomach should be fomented, and, if practicable, the patient should be placed in a warm bath. If the inflammation of the stomach be great, twelve or fifteen leeches must be applied.

PREPARATIONS OF LEAD.

Sugar of Lead, Extract of Lead or Goulard-water, Ceruss, Massicot, Litharge, Red Lead.

The effects of these preparations taken into the stomach are not to be confounded with those arising from the vapours of lead.

Effects of the Preparations of Lead taken into the Stomach.

53. When a large dose of a soluble preparation of lead has been swallowed, there arise a sweet, astringent, metallic taste, constriction of the throat, pain in

the stomach, desire to vomit or vomiting, what is thrown up being often mixed with blood; in short, all the symptoms described in § 14., as the consequences of swallowing corrosive sublimate. If, in place of taking a large dose of lead, water or wine, containing but a small portion has been swallowed, no immediate inconvenience is felt; but if the practice of drinking such water be continued, there arises eventually a disease similar to the colic of painters, of which we shall shortly speak, but which, in certain cases, becomes true palsy.

Considerations on the Employment of the Preparations of Lead.

54. The metal may be swallowed without inconvenience; yet all utensils made of it ought to be proscribed, because it is attacked by many acids which dissolve it, and render it poisonous. It is proved, however, that utensils made with an alloy of equal parts of tin and lead, may be used without danger; for

neither vinegar nor lemon-juice attack this alloy.* It is very dangerous to drink water preserved in vessels of lead and exposed to the air, for it eventually produces serious accidents, and the consequence may even be death.

Lastly, serious diseases have been known to arise from the use of rain-water which had been transmitted through pipes of lead. Wine of a bad quality, which has had any of these preparations mixed with it, in the view of rendering it less acid, is still more dangerous than water containing lead.† Syrups and brandy clarified with sugar of lead retain a portion of this metal, when badly purified; it is therefore dangerous to procure them from persons who do not possess the requisite knowledge to effect their purification properly. It may be

* Except when boiled in it. TRANS.

† Sugar of lead is sometimes added to cyder, to give it a sweetish flavour; this occasions the same symptoms as the wine. From the frequent occurrence of the disease caused thereby in Devonshire, it is called the *Devonshire Colic.* TRANS.

alleged, that this is practised daily without any serious injury; we agree to the truth of this, but we consider it right to mention the fact, as it may become the source of some fatal accident.

Treatment.

55. We have ascertained by experiment that Glauber's salt, Epsom salts, hard water, that is, water holding in solution sulphate of lime, are the best counter-poisons to the preparations of lead. The treatment in this case should be precisely the same as that recommended for the salts of barytes, § 46. Liver of sulphur, which has been recommended by some, is dangerous, and should be discarded.

Properties of the Preparations of Lead.

56. All the preparations of lead heated to redness with potash and charcoal, are decomposed and reduced to a metallic state. A solution is known to contain

lead, 1. by adding some sulphuric acid, which causes a white precipitate; 2. by sulphuretted hydrogen, which produces a black deposit *; and lastly, by the liquid having a sugary taste.

Effects of the Vapours arising from Lead, or the Colic of Painters.

57. Painters, plumbers, glaziers, preparers of colours, and, in general, all workmen who handle the metal frequently, or are exposed to its emanations, are subject to a disease known under the name of Lead Colic, or Colic of Painters, which is a true poisoning by emanation. For the most part, the disease commences

* In order to apply this test, add to a portion of the suspected liquor, about half its bulk of water impregnated with sulphuretted hydrogen gas. If lead be present, it will be manifested by a dark-brown, or blackish tinge. This test is so delicate, that water condensed by the leaden worm of a still tub is sensibly affected by it. It is also detected by a similar effect, ensuing on the addition of sulphuret of ammonia, or potash.

Henry's *Chemistry*.

with pain of the bowels, which is not acute, nor of long duration; these pains do not fail to return, and then they are insupportable. The mouth is dry; there is a desire to vomit, and the vomiting sometimes lasts for several days; the matter vomited is very bitter, of a green or black colour; the evacuations are very difficult, and the excrements are yellow, hard, round and similar to those of sheep. Sometimes on the contrary there is a great looseness, the belly sinks, especially towards the navel; and this sinking in of the navel is so much the more observable as the pain is more intense. Frequently the pain is diminished by pressure gradually increased upon the belly; fever is seldom or ever present, and it is very rarely that the patient complains of pain in the head, or giddiness. In some cases, but these are very rare, the symptoms above detailed, far from being developed in this gradual manner, manifest themselves with the greatest rapidity.

Treatment.

58. Experience has proved the following method, employed at the Hopital da la Charité at Paris, to be very successful.

First Day

Purgative Glyster.

Boil for ten minutes, four ounces of senna leaves in a pint of water, and to the strained liquor add half an ounce of Glauber's salt, and four ounces of antimonial wine.

This should be given in the morning, and in the course of the day, the following

Purgative Potion.

Boil two ounces of cassia in a quart of water for fifteen minutes, and to the strained liquor add one ounce of Epsom salt, and three grains of tartar emetic; and if the disease be very violent, one ounce of syrup of buckthorn, and one drachm of confection of scammony. In

the evening the following glyster should be administered :

Anodyne Glyster.

Six ounces of olive-oil, twelve ounces of red wine, and one drachm of confection of opium. *

Second Day.

Emetic.

Early in the morning, three grains of tartar-emetic should be given ; and the same dose repeated an hour after ; some warm water and honey ought to be given to encourage vomiting. In the course of the day, after the vomiting has ceased, the following

Sudorific Mixture.

One ounce of guaiacum, sarsaparilla, and smilax or china-root, should be

* The translator has been obliged to substitute the preparations of the London Pharmacopæia for those of the author, in two instances ; confection of opium for the theriaca, and confection of scammony for the confection of hamech.

boiled in three quarts of water, and reduced to two; to the strained liquor add half an ounce of liquorice, and one ounce of sassafras; the decoction is then to be slightly boiled again. In the evening, the glyster and opiate as on the first day.

Third Day.

Gently Aperient Mixture.

To a quart of the sudorific mixture, add one ounce of senna leaves, and boil them for a few minutes. This is to be divided into four doses, and taken at intervals of three-quarters of an hour, beginning early in the morning. During the remainder of the day, give the simple sudorific mixture, and at night the anodyne glyster and opiate, as on the first day.

Fourth Day.

In the morning early give the following

Purgative Draught.

To a glass of decoction of senna (prepared by boiling a quarter of an ounce of

the leaves in five ounces of water, till reduced to three ounces) add half an ounce of Glauber's salts, one drachm of jalap and one ounce of syrup of buckthorn. In the course of the day give the sudorific mixture, and at night repeat the anodyne glyster and opiate.

Fifth Day.

In the morning give the gently aperient mixture of the third day at four different times, and at night repeat the anodyne glyster and opiate.

Sixth Day.

Same treatment as the fourth. If there be not copious evacuations, give the following

Purgative Boluses.

Ten grains of scammony, the same of jalap; twelve grains of gamboge, and one drachm and a half of confection of scammony. Mix and divide into twelve parts.

Give one of these every two hours,

and during the intervals the sudorific mixture.

If the mixtures prescribed are vomited, give the emetic in glyster, prepared by mixing one grain of tartar-emetic with a pint of water.

It is very rare, that after such treatment, the patients fail of being cured.

IRRITATING VEGETABLE POISONS.

Botanical Names.	Names in popular use.
Aconitum	Monk's-hood or Wolf's-bane.
Anemone	Wind-flower.
Bryonia	Bryony, or Wild Vine.
Clematis	Virgin's-bower, or Traveller's-joy.
Colchicum Autumnale	Meadow Saffron.
Colocynthis	Bitter-apple.
Chelidonium majus	Tetterwort.
Daphne Mezereum	Mezereum, Spurge Olive, or Widow's-wail.
—— Guidium, vel Thymelæa	Spurge Flax, or Flax-leaved Daphne, or Garow.
Elaterium	Wild, or Squirting Cucumber.
Frettillaria imperialis	Imperial Crown.
Euphorbium.	

Botanical Names.	Names in popular use.
Helleborus, niger et albus	Black and White Hellebore.
Gambogia	Gamboge.
Gratiola	Hedge Hyssop.
Lathyris	Spurge.
Narcissus	Daffodil.
Ricinus Major	Barbadoes, or Purging Nut.
——— Palma Christi.	
Ranunculus	Crow-foot.
Rhus Radicans.	
Sedum acre	House-leek, or Sangreen.
Sabina juniperus	Savine.
Scilla maritima	Squill, or Sea-onion.
Staphysagria delphinium	Stave-acre, or Louse-wort.
Scammonium	Scammony.

Effects.

58. An acrid pungent taste, more or less bitter, excessive heat, great dryness of the mouth and throat, painful constriction of the throat, desire to vomit; vomiting; the efforts being continued even after the stomach has been emptied; purging; pain, more or less violent, in the stomach and bowels; pulse strong, frequent and regular; respiration accelerated and rendered difficult; generally a staggering

step, as if from intoxication; the pupil of the eye dilated; insensibility, so great as to induce a belief that death has taken place; the pulse becomes slow, and loses all its force, and death quickly closes the scene. Some of these poisons occasion convulsions, more or less violent, rigidity of the limbs and acute pains, which cause the most plaintive cries to be uttered. The poisonous properties of these plants vary considerably with respect to the intensity of their action; the greater number may even be rendered useful to man, in several diseases, if taken with proper precautions.

Treatment.

59. The treatment differs, in general, but little from that recommended for corrosive sublimate, § 17. except that here the white of egg is not necessary. Tartar emetic, vinegar, and other irritating fluids are to be refrained from, as they only increase the disease.

It sometimes occurs that the poison does not occasion great pain in the

stomach, but vomiting, attended with a very remarkable depression and insensibility. In this case, after having favoured the vomiting by sugar and water, several small cups of coffee should be given. This is to be prepared by infusing a quart of boiling water upon eight ounces of coffee for half an hour, and straining it. At the same time, three or four grains of camphor, mixed with water by means of white of egg, may be given. Should the coffee be rejected, it must be administered by glyster and by friction. If pain should come on in the stomach and bowels, twelve or fifteen leeches must be applied. When in place of the depression and insensibility there occurs great excitability, convulsions, delirium, &c., it is necessary, first to excite vomiting by sugar and water, and then to give the opiate mixture, or decoction of poppy, § 6.

Aconite. — The root, juice, and leaves of this plant produce serious accidents when eaten or applied to wounds. Seve-

ral savage tribes poison their darts with the aconitum cammarum. *

Anemone. — The roots, young sprouts, and other parts of this plant are poisonous, even when externally applied. The acrid nature of some species is so great, that there are examples of persons having been poisoned, and whose eyes had been greatly inflamed, solely from having reduced them to powder. The inhabitants of Kamtschatka employ the anemone to poison their arrows.

Bryony. — The root of bryony is sometimes given as a purgative; but in strong doses it inflames the stomach and intestines.

Clematis. — Many species of clematis are poisonous, when eaten; and when applied to the skin, they cause excoriations.

Colchicum.† — The seed of colchicum is

* The *Aconitum cammarum*, or purple Monk's-hood, has flowers of a paler blue, a much longer helmet; and the cluster is shorter than the Aconitum napellus, or common Monk's-hood, or wolf's-bane. Its stem is also higher, rising sometimes to six feet.

† This is the chief ingredient in several nostrums sold as remedies for the gout. TRANS.

very dangerous; and the bulbs may, in some climates, occasion serious accidents.

Colocynth. — The wine of colocynth, and other preparations of a similar nature, of which charlatans make great use, and by which they pretend to cure numerous diseases, ought to be taken with great caution, and only by the advice of a physician; for they may become destructive to life, either introduced into the stomach, given in glysters, or applied to the skin.

Celandine causes inflammation of the parts which it touches.

Daphne Mezereum. — This plant and its fruit ought equally to be regarded as poisonous.

Daphne Guidium or *Garow*, often used in surgery as a caustic, is a powerful corrosive poison, and may cause death, even when applied to the skin.

Elaterium may produce death, if given in a strong dose, for it inflames the stomach and intestines.

Hellebore, Black and White. — The roots of both species are very poisonous

when taken internally or applied to wounds; and even when rubbed upon the sound skin, they occasion excessive vomiting and a great languor.

Euphorbium. — The greater part of the plants under this name yield a juice which is powerfully corrosive. *

Gamboge inflames the part which it touches, and may consequently produce death when taken in a large dose.

Gratiola. — It is greatly to be wished that persons would, for their own interest, renounce that swarm of charlatans, to whom the most serious diseases offer nothing to create despair; and who do not hesitate to administer, without dread, this and other plants of a similar nature, which excite great inflammation of the bowels, and frequently conduct the unfortunate victims to the grave. Unhappily we could adduce a multitude of facts in support of this assertion.

Ricinus Major is a powerful caustic, of which the employment is very dangerous.

* See Yonge, Philos. Trans. for 1760, p. 662.

Ricinus Palma Christi. — The seeds of this are powerfully cathartic, and inflame the stomach.

*Ranunculus.** — What is said of the last may be also said of the greater part of the plants under this name.

Rhus Radicans exhales, especially during the night and in the shade, a very noxious vapour; and persons who pass or touch the plant experience smarting pains, hardness, and swelling, with other disagreeable symptoms. It appears, on the contrary, that its effects cease at noon-day, or when exposed to the sun.

Savine, too often used by charlatans and others, is very caustic, and may occasion death.

* The translator lately saw in the Tours hospital, an instance of the virulent effects of the ranunculus. A female being in a state of convalescence, and fearing to be discharged, caused a very extensive and deep ulcer by the application of the ranunculus sceleratus, or water crow-foot. She endeavoured to persuade the physician that it was a return of her complaint (Erysipelas).

This species is better known in England under the name of ranunculus palustris. TRANS.

In the Toxicology, or general treatise upon Poisons, the history of many other irritating plants may be found. It is only the principal ones that could be mentioned in the present summary.

SECOND CLASS.

NARCOTIC OR STUPEFACTIVE.

This class comprehends the following poisons — opium; henbane; Prussic acid, and all substances which contain it, as the lauro-cerasus or cherry laurel, the oil, extract, and distilled water of the same, and bitter almonds; lactuca virosa, or opium-scented lettuce; solanum, or nightshade, of the different species of which the nigrum is the most virulent; the yew, and the lentil (ervum ervilia).

Effects.

60. When any of the above poisons are introduced into the stomach, or ap-

plied to a wound, the following effects are noticed; stupor, numbness, heaviness in the head, desire to vomit, slight at first, but afterwards insupportable; a sort of intoxication, stupid look, the pupil of the eye dilated, furious or lively delirium, sometimes pain; convulsions more or less violent in different parts of the body, palsy of the limbs, pulse variable, but in general strong and full at the commencement of the disease, respiration somewhat accelerated; vomiting, especially when the poison has been applied to a wound or given in the form of glyster; the convulsions and sinking of strength rapidly increase, and death ensues if relief be not quickly given.

Treatment.

61. If the poison has been introduced into the stomach *, we ought to begin by giving four or five grains of tartar emetic

* This treatment is not applicable to the Prussic acid.

in a glass of water. If at the end of a quarter of an hour vomiting does not take place, twelve grains of sulphate of zinc (white vitriol) must be given in a glass of water, and repeated after an interval of a quarter of an hour, if necessary. If these measures do not succeed, three or four grains of blue vitriol (sulphate of copper) must be administered; all this is with the intention of ejecting the poison by one or the other channel. The success of these remedies may be favoured by irritating the throat with the finger or a feather. The emetic ought not to be dissolved in a large quantity of water, neither should much liquid be given with the view of hastening the vomiting; as, far from their being useful, the disease is thereby aggravated.*

* The direction to refrain from giving a large quantity of fluid in this case, may perhaps appear contradictory to some; but if the following facts are attended to, it will be perfectly clear: — The principal property of the first class is to inflame the parts they touch, and this effect is diminished

Experience has proved that vinegar and lemon-juice (so much recommended by some physicians) ARE VERY INJURIOUS, if given before the poison has been expelled either by vomiting or stool. If it be supposed that the poison has been taken long enough to reach the intestines, the purgative glyster, § 57., ought to be administered.

62. The poison being altogether evacuated, or nearly so, the patient is still far from being out of danger, and may yet sink if abandoned to himself. It is then necessary every five minutes to administer alternately a cup of water acidulated with vinegar, lemon-juice, or cream of tartar *; and a cup of coffee, prepared by infusing for ten minutes a quart of boiling water upon eight ounces of coffee, and then straining it; the

---

by dilution. On the contrary, opium does not inflame the part it touches, and only acts in proportion as it is dissolved. TRANS.

* Or any vegetable acid at command, as cyder, perry, the juice of grapes, oranges, &c. TRANS.

limbs should be rubbed with a piece of flannel or a brush. The use of the coffee and acidulated water must be continued until the patient be out of danger.* When the drowsiness is extreme, and the disease resembles an attack of apoplexy, and no alleviation is obtained by the means recommended, bleeding at the arm (or, what is preferable, in the jugular vein) must be had recourse to.

63. If the poisoning has arisen from an application of the narcotic to external wounds, time is not to be lost by endeavours to excite vomiting; but the use of coffee, acidulated water, &c., as directed in § 62., must be immediately resorted to.

Opium, *laudanum*, and *poppy* heads, from which such great advantages in

* I knew an instance of acids being administered to that degree to counteract the effect of two ounces of laudanum, which had been taken by mistake, that the patient could not obtain any rest for forty-eight hours; nor then without the aid of syrup of poppies. TRANS.

medicine are obtained, are more or less poisonous; opium in substance more especially so.

Henbane. — The root of black henbane has been sometimes confounded with the parsnip, and used in soups, which has occasioned very serious accidents; the leaves are also very poisonous. Great trembling of the limbs, and a sort of intoxication, have been known to arise solely from the use of a plaster, in the composition of which henbane entered. The other species of henbane, as the white, &c., are likewise poisonous.

Prussic Acid. — Among the known poisons this is indubitably the most energetic. It is sufficient to apply one or two drops upon the eye, tongue, &c., of the strongest dog to occasion its death in the space of two minutes. Happily the difficulty of obtaining and preserving this poison renders it excessively rare, and consequently but little calculated to become the instrument of crime. Cherry laurel, its oil, extract, and water, when several times distilled, are poisonous from

their containing Prussic acid; and the same may be said of bitter almonds, especially such as are very odoriferous and very bitter.*

Treatment.

64. If the symptoms have been occasioned by a dose of weak acid †, or by plants which contain it, vomiting is to be excited as directed § 61., and then the infusion of coffee indicated § 62. must be administered. Lastly, at intervals of half an hour, three or four table-spoonfuls of oil of turpentine mixed with coffee must be taken.

The lactuca virosa and solanum are far from being, at least in our climate, so dangerous as some have announced.

* The essential oil of every bitter kernel is poisonous. Trans.

† When the concentrated acid has been taken, death takes place before any succour whatever can be given.

THIRD CLASS.

ACRID NARCOTICS.

This class comprehends: —

1. The mushroom species.
2. Nux vomica, upas, false angustura, faba sancti ignatii, camphor, cocculus indicus.
3. Tobacco, hemlock, belladonna, stramonium, digitalis, laurel-rose, rue, mancenillier.
4. Spirituous liquors.
5. Emanations from flowers.
6. Horned or spurred rye.

I. ON MUSHROOMS.

The mushroom, or agaric, is one of the most extensive genus of plants in nature; botanists having enumerated upwards of three hundred species of it already, and probably there are many

that have not yet been noticed.* Of these, the greater part are more or less poisonous.

Circumstances which should induce us to suspect the poisonous nature of Mushrooms.

65. Mushrooms, which grow in thick forests where the light of the sun does not penetrate, are in general bad; their surface is moist, more or less dirty, and they have a disagreeable appearance. Those which are heavy, with a moist surface and nauseous smell, and which, on being cut, present different colours, changing from time to time, and found in shaded places, are also to be rejected. The same may be said of those which grow quickly and decay immediately; of those bitten, and abandoned by insects;

* Dr. Withering ascertained and described 282 British species besides several varieties. In many parts of Europe several sorts are eaten, which are thought with us to be poisonous. TRANS.

Consult on this subject Dr. Heberden's paper in the Medical Transactions of the College, ii. 216.

and of those with a soft stalk, and covered with patches of skin.*

Effects of poisonous Mushrooms.

66. Mushrooms act in a different manner, according to the species to which they belong.

The following may be considered a general description of the symptoms to which they most frequently give rise: —

Nausea, excessive heat, and pain in the stomach and bowels, accompanied by purging and vomiting; these are succeeded by unquenchable thirst, convulsions, and fainting fits; the pulse becomes small, hard, and frequent; delirium ensues; and, if relief be not afforded, great stupor succeeds, from which the pa-

* To try mushrooms:

Take an onion, and strip the outer skin, and boil it with your mushrooms. If the onion becomes blue or black, there are certainly dangerous ones amongst them; if it remains white they are good. See article *Mushroom*, Encyclopedia Britannica.

TRANS.

tient is roused only by the violence of the convulsions. These symptoms having lasted some time, cold sweats come on, and death closes the scene. In some cases, the intellectual faculties are preserved entire. In general, mushrooms do not manifest their action until five, seven, or twelve hours after they have been eaten; sometimes even twenty-four hours elapse before any symptoms are felt.

Treatment.

67. Experience proves that the most poisonous mushrooms, left some time in vinegar, salt and water, or æther, lose their poisonous qualities; but these fluids, having dissolved the active parts, ought then to be regarded as poisonous. It follows, from what has just been said, that none of the above fluids are to be given, as long as any portion of the mushroom may be supposed to remain in the stomach or bowels, as they dissolve in the stomach the noxious parts

and render the effects more terrible. When symptoms of poisoning from mushrooms are complained of, give three grains of tartar emetic in a glass of water; fifteen minutes after, a second glass, with one grain of emetic, eight grains of ipecacuanha, and three drachms of sulphate of soda, and repeat this every twenty minutes, till copious vomiting is produced. When the stomach may be supposed to have discharged the whole of its contents, we must endeavour to obtain an evacuation of such portion of the poison as may have passed into the bowels. To effect this, let a desert spoonful of the following mixture be given every half hour: Two ounces of castor oil, with three ounces of syrup. Then administer the following glyster: Boil, for fifteen minutes, a quart of water with two ounces of cassia, a drachm of senna, and half an ounce of Epsom salt. This must be repeated twice or thrice, if copious evacuations be not obtained.

If, notwithstanding these measures,

he mushrooms be not evacuated, and the disease continues, boil an ounce of tobacco in a quart of water, for fifteen minutes, and give the decoction in the form of glyster. This very rarely fails to excite vomiting. After the poison is evacuated, give two spoonfuls of the following mixture from time to time. Four drachms of æther, or Hoffman's anodyne liquor, two ounces of syrup, and four ounces of orange-flower water. If the disease continue, and great pain of the stomach be complained of, give plenty of decoction of linseed, gum-water, or sugar and water, apply cloths steeped in the decoction to the bowels, and, if possible, use the warm bath. If this be not sufficient, apply ten or twelve leeches to the most painful parts of the belly, and follow the directions given § 59. If assistance be not given till after the stomach has become swelled and very painful, the mouth and throat excessively hot and dry, with ardent thirst; in short, if much fever be present, the irritating purgatives are to be abandoned, and

leeches to the belly, bleeding, fomentations, and glysters of decoction of linseed, must be had recourse to.

II. NUX VOMICA, UPAS, FABA SANCTI IGNATII, FALSE ANGUSTURA, CAMPHOR, COCCULUS INDICUS.

Effects.

68. INTRODUCED into the stomach, or applied to wounds, these poisons are rapidly absorbed, and affect the brain and spinal marrow near the neck. They occasion a general rigidity, and convulsions; the head is thrown back, the chest is dilated with difficulty, respiration becomes greatly impeded, and death is the consequence, and this in a very few minutes, if the dose of poison has been great. None of these inflame the parts they touch. The effects of some of these poisons are not continued, but occur in paroxysms, from time to time, in the intervals of which the patient appears little affected.

Nux Vomica, employed to kill dogs, is a poison to man also, though the contrary has been advanced by some physicians.* It must, therefore, be used with caution.

Upas Tieuté is the juice of a plant which grows in Java, and is used by the savages to poison their arrows. It is difficult to give an idea of the celerity with which these weapons occasion death.

Upas Antiar is another species of the former, and is used in precisely the same manner.

Ticunas, or American poison, is a substance also prepared from the juice of plants, particularly a species of ivy. When dry it may be placed on the eye without danger, and the vapours arising from it when heated, may be respired without any ill effects: but when applied to deep wounds, particularly if the part of the arrow which contains it be steeped in warm water, it becomes exceedingly dangerous.

Camphor is an excellent remedy in a

Perhaps this assertion arises from the fact, that entire seeds of the Nux vomica have passed the

number of circumstances, and few persons regard it as a poison; it has, however, been proved, that when dissolved in oil, or any other fluid, and administered in a strong dose, it may occasion death.

Cocculus Indicus is a poison to man, as well as to various animals.

Treatment.

69. The emetic, as directed § 67., is to be given, and vomiting favoured by irritating the throat with a feather; the impeded respiration is next to be attended to, since that is the principal cause of death: to remedy this, the lungs must be inflated in the manner directed § 104., and two spoonfuls of the following mixture must be given internally every ten minutes: — Two ounces of water, one drachm of æther, two drachms of oil of turpentine, and half an ounce of sugar.

70. If the poison has been introduced by a wound, the same treatment, that is, the administration of the turpentine

mixture, and inflation of the lungs, is to be pursued; in addition to which, the wound should be cauterised with an iron heated as much as possible, and a ligature should be tightly applied above the wounded part.

If the patient be robust, blood-letting may be performed. Salt water, employed by the Indians, and regarded by them as an antidote to these poisonous substances, ought to be rejected.

III. TOBACCO, BELLADONNA, STRAMONIUM, DIGITALIS, THE ROSE-BAY OR OLEANDER, RUE, HEMLOCK (CICUTA MAJOR OR CONIUM MACULATUM), THE LESSER HEMLOCK (ÆTHUSA CYNOPIUM), DARNEL OR RYE-GRASS (LOLIUM TEMULENTUM), MANCHINEEL (HIPPOMANE MANCINELLA), HORNED RYE (CALLED BY SOME WRITERS SPEARED OR SPURRED RYE.)

General Effects of these Poisons.

71. The Poisons treated of in this section introduced into the stomach, or applied to wounds, give rise to the following symptoms: agitation, pain, sharp

cries, a sort of delirium more or less acute, convulsive movements of the face and limbs; the pupil of the eye is dilated, the pulse strong, full, frequent, and regular; or small, slow, and irregular; nausea, succeeded by violent vomiting and purging, with pains in the stomach more or less violent. Sometimes in place of great agitation, we observe a sort of intoxication, with great weakness and general trembling, succeeded by insensibility; in this case there is no nausea.

Treatment.

72. If there has been no vomiting, give an emetic, as we have advised when speaking of opium, § 61. If a long time has elapsed since the poison has been swallowed, administer the purgatives mentioned in the same paragraph.

Should the patient appear to be in a state of apoplexy, even after the stomach and bowels have been evacuated, he should be bled in the arm, or, what is preferable, in the jugular vein. The

vinegar and water, recommended under the article opium, may then be administered. *Observe, this remedy is injurious if taken before the poison has been evacuated.* On the contrary, if the pain of the stomach be very great, and the poison not yet evacuated, twelve leeches should be applied to the seat of pain, and the patient made to drink sugar and water, linseed, or mallow infusion; in a word, the directions given, when speaking of acrid plants, § 59., are to be followed.

Tobacco. — It is necessary to make known the effects of Tobacco, in order to enable us to avoid the dangers to which it may give rise. Violent vomiting, with a sort of intoxication, has been observed to arise from the application of an ointment prepared with powdered tobacco and butter. The same accidents have taken place from the use of a decoction of tobacco used as a wash in some cases of itch.* It has even been asserted,

* An instance is recorded in Dr. Duncan's Medical Commentaries, xi. 327.

that the death of an individual was caused by his having taken a large quantity of snuff. The dangerous effects of tobacco, when placed upon wounds, is known to all persons who observe these things with attention. Introduced into the stomach, tobacco occasions vomiting, purging, great trembling and convulsions, and may even occasion death, as the example of the celebrated Santeuil proves. *

Belladonna. — This is a very energetic poison; the fruit when ripe resembles a black grape, for which it has often been taken with very fatal results. The two may readily be distinguished by observing, that the fruit of the belladonna is double, whereas that of the grape is single. This is one of those poisons which occasions most frequently a very

* Santeuil was a celebrated Latin poet, born at Paris, 1630. His death was caused by an inconsiderate person emptying the contents of a snuff box into his wine, which, as soon as he had swallowed it, threw him into great agonies, and put a period to his life in fourteen hours. TRANS.

lively delirium, attended with a silly idiotic laugh. *

Stramonium. — This is also a very violent poison; furious delirium, convulsions, palsy, great trembling, and death, have arisen from the drinking of water in which the fruit and grains of this plant had been boiled. †

Digitalis. — The powder, tincture, the spirituous and watery extracts of digitalis, are energetic poisons when applied to wounds. These preparations, when taken in large quantities, give rise to violent vomiting, which is shortly followed by excessive weakness and death, if the means recommended in § 72. be not administered.

Rose-bay, or *Oleander.* — It has been clearly proved, that the rose-bay, introduced into the stomach, is a poison for man, horses, sheep, dogs, &c. It has

* See Pulteney, Philos. Trans. for 1757, p. 62.; and Bromwell, in the Medical Observ. and Inquiries, vi. 222.

† See Johnson, in Medical Facts and Observations, v. 78.

been stated, that a person died in consequence of being shut up in a bed-room which contained a quantity of the flowers of this plant. This poison occasions vomiting, inflammation of the part which it touches, and stupefaction.

Rue. — Rue, in large doses, occasions great agitation, fever, pain in the throat, and inflammation of the part which it touches. Its essential oil is exceedingly active.

Hemlock (cicuta major). — Hemlock is extremely poisonous in hot climates; it is even so in temperate climates, if gathered in a state of maturity. It may easily be distinguished by its stalk, which is cylindrical, and covered at its inferior part with brownish-purple or black spots. It occasions death even when placed upon wounds. Water hemlock is still more poisonous than the last.

The *lesser Hemlock*, or *Fool's Parsley* (æthusa cynapium).—The lesser hemlock is sometimes confounded with parsley, from which it may be distinguished by the following characters :—First, the upper

surface of the leaves is shining, and of a blackish-green colour. Secondly, they diffuse no odour when entire, but when rubbed between the fingers, they have an odour which is extremely offensive. The lesser hemlock is very poisonous; it causes vomiting, intoxication or delirium, great numbness of the extremities, &c. For *Treatment*, see § 72.

Darnel or *Rye-grass* (lolium temulentum.)—Bread, with which darnel has been mixed, gives rise to very unpleasant symptoms, such as a general or partial trembling, a sort of intoxication almost incessant, singing of the ears, great heaviness of the head, with pain in the forehead, great difficulty of speaking and swallowing. The respiration is obstructed, the stomach painful, and there is much nausea; these symptoms are followed by a state of insensibility. Vinegar and water, lemonade, or orange-flower water, mixed with honey and vinegar, have been recommended in such cases.

Manchineel (hippomane mancinella).—The fruit of this tree possesses a very

poisonous juice, which taken into the stomach causes a most violent burning sensation. The savages make use of this juice to poison their arrows. The rain which washes the leaves and branches of this tree occasions blisters, as if boiling oil had been applied. The hands and faces of some negroes have been known to be exceedingly swelled and very painful, from having cleft a small branch of this tree. It has been asserted, (but this wants confirmation,) that even its vapour causes the bodies of those who repose under its shade to swell. *

IV. SPIRITUOUS LIQUORS.

Intoxication. — Not only wine, æther, and spirituous liquors, taken in large quantities, occasion intoxication, but also air which is charged with the vapours of spirituous fluids; such, for example, as that of a confined room, in which several open vessels of spirits are placed. The

* See Peyronel, Philos. Trans. for 1758, p. 772.

symptoms of intoxication, so generally known, are almost always dissipated at the end of ten, twelve, or fifteen hours; but as the contrary may occur, and the individual is then in much danger, we have judged it right to indicate the means of combating them.

Begin by giving two or three grains of tartar emetic, dissolved in a glass of water, and favour the vomiting by abundance of warm water, and by tickling the throat with a feather; when the individual has vomited, make him take every ten minutes half a glass of water mixed with a spoonful of vinegar or lemon-juice, and administer the glyster ordered § 57., and rub the body with cloths steeped in vinegar. If, in spite of these measures, the individual continue in a state of insensibility, and he be robust, let him be bled from the arm, or rather apply twelve leeches to the neck.

EMANATIONS FROM FLOWERS.

Persons, who reside with impunity

in rooms filled with odoriferous flowers, have much difficulty in believing that some individuals are unable to remain even for a few minutes in such apartments without suffering most unpleasant symptoms, such as head-ach and nausea; which, with some, are followed by convulsions and swooning; experience, however, proves the fact to be perfectly true. The odour of the rose, lily, honeysuckle, &c. have occasioned the symptoms we have detailed above.

The odour, which is disengaged when peeling black hellebore, or colocynth, has, in certain cases, produced purgative effects. Lastly, historians relate, that some great personages have died in consequence of using perfumed gloves, and the vapours exhaled from certain torches prepared with odoriferous substances; among others, the Emperor Henry IV. and Pope Clement VII. have been named.

Treatment.

After removing the sufferer from the

apartment in which the flowers are placed, into the air; make him respire the vapour of vinegar, and let him drink some sugar and water. If he be in a swoon, let him be treated in the manner directed § 104. If in convulsions, administer the anti-spasmodic mixture prescribed § 7.

VI. HORNED RYE, CALLED BY SOME WRITERS SPURRED OR SPEARED RYE.

Characteristics. — Rye is sometimes affected by a disease which changes its form and composition, and by which it is rendered poisonous. It is covered with a violet-coloured skin, and becomes bent and lengthened into the form of a horn or spur; to this the name of *ergot* has been given, and the rye is said to be *ergoté.** These grains break short

* Ergot is French for cock's-spur, and horned rye was called ergot from its resemblance to that part. In the year 1710, one-fourth of the rye raised in the province of Salonia, in France, was horned, and the surgeon of the hospital at Orleans

and easily, producing a noise like a dry almond. When reduced to powder they have a disagreeable odour and an acrid taste, similar to bad wheat. The dough and bread which contains this substance has a number of violet-coloured spots.

Effects produced by eating a small Quantity of Horned Rye.

When bread which contains this Rye is eaten, the following symptoms are experienced *: an uneasy sensation in the

---

had no less than 500 under his care, who were distempered by eating it. They were surnamed Ergots; they consisted chiefly of men and boys; the number of women and girls was very small.

It has been supposed by some, that ergot proceeds from the grain of the rye having been pierced at the first moment of its appearance by an insect which deposits a liquid that excites fermentation. Others imagine, it arises from the poverty and humidity of the soil. See Article *Secale*, Encycl. Brit. Trans.

* These effects are copied from J. A. Srine, who gave a description of the epidemic which devastated Bohemia in 1736. Author.

feet similar to the stinging of ants, (or the sensation vulgarly termed pins and needles;) immediately after a sharp pain is felt in the stomach, nausea, the hands and feet become affected; the fingers are so violently contracted that the strongest man has a difficulty in putting them straight, and the limbs appear as if out of joint. The unhappy sufferers utter the most piercing cries, and feel as if their hands and feet were consumed by fire. The head becomes heavy, as if in a state of intoxication; the sight is obscured by a thick cloud, so much so in some cases, that blindness takes place, or the individual sees double; the intellectual faculties are deranged; the body is turned back so as to form a perfect arch; the mouth contains a yellow or greenish froth which is almost bloody; the tongue is often torn by the violence of the convulsions, and becomes so swelled as to obstruct the respiration; great salivation takes place. These symptoms are followed by canine appetite, and it is rare that the patients have

any aversion to food; sometimes spots are observed upon different parts of the body.

Effects produced by a large Quantity of Horned Rye.

When a large quantity of horned rye has been taken, or its use continued for some time, the disease begins with a sharp pain, together with intolerable heat in the feet and toes; the pains ascend to the leg, the foot first becomes cold, pale, and livid, and then insensible, and the leg exceedingly painful and cold. The pain is more acute during the night than the day, there is great thirst, but the appetite remains, and the evacuations proceed regularly. The patient is unable to move, or support himself upon his legs; violet-coloured spots and little blisters arise, gangrene shows itself in all its horror, and rises to the knee. The leg is detached from its articulation, an ulcer of a bright red colour is formed, which is

readily healed, provided the patient does not absorb anew the putrid matter by lying in a bed infected with it, and is not at the same time badly nourished, or does not inhabit a cold and moist situation. (Letter of M. Francois to the editor of the Gazette de Santé.)

Treatment.

72. If the disease be slight, and if there be but little fever with the headach and convulsive movements, give a small wine-glass-full of the anti-spasmodic mixture indicated § 6, and let the patient drink some water mixed with a little vinegar or lemon-juice.

If pain be succeeded by great numbness and cold, announcing the approach of gangrene, endeavours must be used to prevent it. Place the patient in a clean bed in a dry and warm apartment, and let the bed-clothes be frequently changed.

Several physicians have recommended the employment of an emetic, when the

tongue is furred with a bitter taste in the mouth, and frequent nausea. Experience, however, proves that such a medicine increases the irritation, and may occasion a looseness, which is always to be dreaded. However, when we are obliged to give an emetic to remove the symptoms we have just spoken of, we ought to prefer ipecacuanha. Pour half a-pint of boiling water upon a drachm of ipecacuanha; and after it has stood about ten minutes strain it: give a wine-glass-full of this infusion every ten minutes till vomiting is produced. A large quantity of warm water should at the same time be given to favour the vomiting.

In cases where the patient complains of great numbness of the lower extremities, he should be placed in a bath prepared with the decoction of aromatic plants, such as lavender, rosemary, sage, &c., sharpened with a little vinegar. On quitting the bath, the foot and leg should be rubbed with the hand, or a piece of flannel, and covered with compresses of linen steeped in an infusion of orange

or elder flowers, to which a few drops of volatile alkali have been added. These compresses may also be steeped in the lixivium, or ley of pearl-ashes, or in the following decoction, of which the patient should take a large wine-glass-full three times a-day : —

Boil four ounces of Peruvian bark in a quart of water for a quarter of an hour ; at the end of this time strain, and add half an ounce of sal-ammoniac and one ounce of camomile flowers ; when cold, let it be strained again.

An infusion of Arnica and of Virginian snake-root, sweetened with syrup of vinegar, or oxymel, have been given with success.

If the numbness and cold continue, apply large blisters ; and if nothing else can arrest the development of gangrene, use the following fomentation several times during the day.

Boil in a quart of water four ounces of calcined alum, three ounces of Roman

vitriol, (sulphate of copper,) and one ounce of common salt. Reduce the liquid to a pint.

If the gangrene take place to a degree that renders amputation necessary, we should wait till nature has established a line of separation between the living and the dead part, which will indicate the spot where the operation ought to be made.

Amputation ought not to be performed, except in cases where the gangrene has seized upon the middle of the leg, and so mutilated it that the sound part would prove, after the cure, an obstacle to motion; and also when the gangrenous parts do not separate sufficiently quickly, but become putrid and infect the patient.

FOURTH CLASS.

SEPTIC OR PUTREFACTIVE POISONS.

This class comprehends the following poisons: namely, that of

1. The viper, and all other animals the bite or sting of which gives rise to accidents more or less serious.

2. Animals that may become baneful by being taken into the stomach.

3. Malignant pustules, and canine madness.

I. The venomous animals, whose bite or sting is accompanied by symptoms more or less severe, are, the viper, the rattle-snake, the Cobra de Capello, Katuka Rekula, Rodroo Pam, Geri Paragoodoo.

For a history of the four last, see "An Account of Indian Serpents, by Patrick Russel. London. 1796."

Several insects, such as the scorpion, tarantula, bee, wasp, hornet, spider,

gadfly, gnat, &c. are to a certain degree venomous.

EFFECTS OF THE BITE OF THE VIPER OR RATTLE-SNAKE.

73. A SHARP pain in the wounded part, which quickly spreads to all the members, and even to the interior of the body; great swelling, which is first hard and pale, then reddish, livid, appears gangrenous, and gradually augments; fainting, vomiting, and convulsive movements. Jaundice sometimes intervenes; the stomach is so irritable that it can retain nothing; the pulse is frequent, small, contracted, and irregular; the respiration is difficult; there are copious cold sweats; the sight is dimmed, and the intellectual faculties deranged. The blood which flows from the wound is blackish, and sometimes a fetid humour oozes out. When the swelling is much increased, the small vessels no longer suffer the blood to circulate, and the pulse becomes hardly perceptible. When all the symp-

toms above enumerated have acquired a certain degree of intensity, the patient dies.

Fontana has asserted that the bite of the common viper never proves fatal to man; but this assertion is not correct, for the viper of Fontainebleau has often occasioned death.

External Treatment.

74. Begin by placing a ligature, somewhat tight, immediately above the wound, and observe that the ligature be not so narrow as to irritate the skin; neither should the ligature be continued too long a time, as this would favour the development of gangrene. The wound should be allowed to bleed, and even a gentle degree of pressure may be used, so as to favour the expulsion of the poison. If possible, the bitten part should be kept in warm water for a time.

Apply to the swelled parts which surround the wound, a mixture composed of one part of volatile alkali, and two of

oil. When the principal symptoms are diminished, remove this, and replace it by a rag dipped in sweet oil; and rub the limb from time to time with the same oil, to which a few drops of volatile alkali have been added.

If the swelling should be very considerable, and the pain acute, remove the ligature, the object of which was to retard the circulation. Scarifications should not be made, as they often aggravate the symptoms.

The wound may be cauterised with one of the following

Caustics.

The actual Cautery. — Heat an iron, somewhat larger than the wound, as hot as possible, and cauterise the part which has been bitten. The hotter the iron is at the moment of its application, the less will be the pain produced, and the more certain the success.

Lunar Caustic. — This should be powdered and strewed over the whole surface

of the wound, which should afterwards be covered with a piece of dry lint and a tolerably tight bandage. This dressing may be removed at the end of four or five hours.

Caustic Potash is to be used in the same manner as the last.

Butter of Antimony. — This caustic is to be preferred, after the hot iron, to the others, and is to be used in the following manner: — Affix a small quantity of fine lint to the end of a piece of thin wood; dip this into the butter of antimony, and apply it to the whole surface of the wound. This should be repeated several times. The part may then be covered with lint and a bandage.

Sulphuric Acid, or Oil of Vitriol. — This is used like the last.

The Ammoniacal Caustic of M. Gaudret. — Heat, gently, half an ounce of olive oil, or oil of almonds, with the same quantity of good suet, and add gradually one ounce of volatile alkali, and keep the mixture constantly stirred until it is cold. A linen rag is to be smeared tolerably

thick with this, and applied to the wound, and allowed to remain a quarter or half an hour, according to circumstances.

Soap-boilers' Ley.—The wound is to be washed with this ley, and covered by a rag soaked in the same, and changed at the end of four or five hours.

Quick-lime and Soap. — A paste may be made of equal parts of good soap and powdered quick-lime, and applied in the same manner as the ammoniacal caustic of M. Gaudret.

Moxa. — Moxa is a cylinder of cloth filled with fine lint, this is placed upon the wound, set fire to at the top, and allowed to remain till entirely consumed.

Boiling Oil. —The wound may be cauterised with boiling oil, but it must be employed with the aid of a funnel pressed firmly upon the wound, so as to prevent the cauterisation of the surrounding parts.

If, after the use of one or other of these caustics, the symptoms are not diminished, the wound must be enlarged,

and the caustic applied again, but still more deeply.

Internal Treatment.

76. This has for its object the promotion of perspiration and sleep. Immediately after the accident, the patient should be made to take a glass-full of orange-flower, or other distilled water, with six or eight drops of volatile alkali; and this to be renewed every two hours; a small glass of Madeira or Sherry may also be given. The patient is to be placed in a bed, well covered, and perspiration promoted as much as possible. A dose of ipecacuanha, or if that be not sufficient, the emetic recommended § 61. should be administered. If there be much bilious vomiting or jaundice, and gangrene continues to make progress, the decoction of bark prescribed § 72, when speaking of horned rye, should be given. If, on the contrary, the symptoms diminish and the individual enters into a state of convalescence, no solid food must

be allowed during the first few days; but only a small quantity of light thin broth.

77. If the bite has occasioned only a slight disease, if there be but little swelling and the individual does not suffer from nausea and fainting fits, we should confine ourselves to enlarge with precaution the edges of the wound; one or two drops of volatile alkali should be dropped upon the wound, and the part afterwards covered with a compress soaked in the same; the limb must be rubbed with warm oil, and enveloped in linen steeped in the same fluid.

78. The patient should be made to take, every two hours, five or six drops of volatile alkali in a glass of orange, elder, or camomile flower water.

*Of the Guaco *, a Remedy which appears extremely efficacious.*

The guaco is a plant found in several parts of America; of which the Indians

* MM. Humboldt and Bonpland have been the first who have given a description of this plant.

make great use, for the purpose of defending themselves against the bites of the numerous venomous reptiles which infest their country. They swallow one or two spoonfuls of the juice of this plant, and inoculate themselves with it in five or six wounds, which they make principally in the sides of the chest and between the fingers. They are then enabled to take with impunity the most poisonous serpents; and if by chance they are bitten, all the symptoms disappear shortly after the friction of the wound with the leaves of the same plant.

Success of Arsenic in this Disease.

Many experiments and some observations, tend to prove that the following mixture is extremely useful in the bite of which we are speaking. *

* See an account of the effects of Arsenic in counteracting the poison of serpents by Mr. Ireland, in the second volume of the Medico-Chirurgical Transactions, p. 393. The Indians are in the habit of administering arsenic in large doses after bites

Arsenic Mixture.

Boil for fifteen minutes one grain of arsenic and one grain of potash in one ounce and a half of water; when the liquid is cold, add one ounce of pimento water, ten drops of laudanum, and half an ounce of lemon-juice.

This is for one dose, which must be repeated every half hour, during four successive hours; that is, if the disease be very serious. At the same time administer the glyster spoken of in § 57., and rub the painful part with a liniment composed of the following ingredients.

Oil of turpentine, half an ounce.
Volatile alkali, half an ounce.
Olive oil, one ounce and a half.

OF THE SCORPION.

79. The sting of the European scorpion is not very dangerous. This insect

---

of venomous animals. See Dr. Russell's History of Indian Serpents, and the authorities quoted in the London Medical Review and Magazine for March and April 1793.

occasions serious danger in those climates only where the heat is excessive; it then produces a red spot of the size of a man's little finger nail, which gradually increases, and becomes very black in the centre; this black spot is the place where the sting entered; the part swells and is painful, the inflammation is more or less considerable, sometimes there are little pustules; to these succeed alternate chills and fever, numbness, vomiting, hiccup, and great trembling.

Treatment.

80. The internal treatment should be the same as that directed when speaking of the viper. As to the external treatment, apply a poultice of linseed meal or bread and milk; and moisten the poultice with ten or twelve drops of volatile alkali.

OF THE WASP, BEE, GNAT, HORNET, GADFLY, TARANTULA, SPIDER, &c.

81. In general, the sting of these insects occasions, in our climate, only a

slight degree of pain and swelling. It is sufficient to rub the part with a mixture of two parts of olive oil, and one part of volatile alkali, and to give internally four or five drops of volatile alkali in a little orange-flower water, or other agreeable fluid.

If the insect has sucked any poisonous plants, the body of an animal that has died of a pestilential disease, or any other putrid matter, and the accident has occurred during a time of extreme heat, the symptoms may become much more serious, resembling those arising from the bite of the viper (see § 73.), and be followed by death. In such a case it is necessary to cauterise the wound, and to act according to the directions given for the treatment of the bite of the viper.

82. Whenever the sting of the insect has been left, it is necessary to extract it, independent of the use of the medicines recommended. The extraction being effected, the wound ought to be washed with a little cold water, or still better, with a little salt water.

A liniment composed of one part of volatile alkali, and two parts of sweet oil, is then to be used, and the part covered with a compress steeped in salt water. Even if the sting has not been extracted, the above liniment is to be used. When a person has been assailed by a number of gnats, and stung in several places, so as to occasion a degree of fever, four or five drops of volatile alkali, in a little orange-flower water, should be taken every fifteen minutes.

II. OF ANIMALS WHICH MAY GIVE RISE TO DANGEROUS SYMPTOMS, WHEN TAKEN INTO THE STOMACH.

83. Muscles, the dolphin, the conger eel, the king-fish (scomber maximus), and the yellow bill (clupea thrissa), with some other fish, may, under certain circumstances, occasion symptoms more or less serious, and even death has been known to be the consequence of their ingestion.

If experience proves that the fish we

are speaking of are sometimes poisonous, it also demonstrates that they are far from being so at all times and to all persons. The individual who can eat them with impunity in our climate, and in all seasons, may be greatly incommoded by them in hot climates, and especially during the summer season. Muscles serve as an aliment to a number of people, yet they sometimes produce most unpleasant symptoms to certain individuals, while no effect whatever is felt by others who have eaten of them at the same time.

Effects of poisonous Fish. *

The dolphin has sometimes occasioned a violent head-ach, nausea, and crimson-coloured spots upon the skin, an insupportable itching, and constriction of the chest.

* For farther observations on this subject consult a paper by Dr. Chisholm, in the Edinburgh Medical and Surgical Journal for October, 1808, vol. iv. p. 393. See also the Philosophical Transactions for 1776, p. 544; and the Memoirs of the Medical Society of London, v. 94.

The conger eel has produced vomiting and purging, with pains in the bowels, fainting fits, convulsive twitching and palsy of the limbs, a coppery taste in the mouth, with a burning sensation in the throat.

The yellow bill (clupea thrissa) has caused horrible convulsions, inflammation of the stomach, and death at the end of half an hour. *

Effects of Muscles.

Muscles have often occasioned acute pain in the head and stomach, with great difficulty of breathing, general uneasiness, redness, and swelling of the face and eyelids, intolerable itching of every part of the body, an eruption of little wheals similar to what are produced by the stinging of nettles †, and this is

* This fish inhabits the shores of America and the Indies.

† This constitutes the disease termed by Dr. Willan *urticaria febrilis*, or febrile nettle-rash. It is occasionally produced by other kinds of shell fish.

particularly observable upon the shoulders; convulsions, and sometimes sudden stoppage in the head, in such a manner, that one would be inclined to say the patient was suffering under a violent cold. Lastly, in certain cases, but very rarely, the above symptoms are followed by death. *

Treatment.

84. Begin by giving the emetic prescribed § 61. If the poison has been some time swallowed, so as to have passed into the bowels, administer a purge and glyster of the same nature, such as is directed § 57. Immediately after these remedies have taken effect, give twenty or twenty-five drops of æther upon a lump of sugar, and the antispasmodic mixture, § 6. Besides which,

* A case is mentioned by Ammans, and Valentinus, in which a man died so snddenly after eating muscles, that suspicion of having administered to him poison fell upon his wife. See Behrens "Diss. de Affectionibus a comestis Mytilis."

mix two spoonfuls of vinegar or lemon-juice in a little water, and let this be taken as a common drink. If there be much fever, with violent and continued pains of the stomach, apply ten or twelve leeches to the upper part of the belly.

CONTAGIOUS MALIGNANT PUSTULE.

85. Butchers, tanners, farmers, shepherds, veterinary surgeons, and all workmen who handle the wool or skin of dead animals, in which putrefaction has commenced, are subject to contract the malignant pustule, if they do not take the precaution to wash immediately, and with care, all the parts which have touched the parts corrupted. Water mixed with vinegar, lixivium, or ley of wood-ashes, and especially water in which lime has been mixed, are the liquids which ought to be used. *

* Water, in which a large quantity of charcoal has been mixed, has been recommended by a physician of London. Charcoal, it is well known, possesses highly anti-putrescent properties. Trans.

It has been long known, that horses, cows, and other animals, under certain circumstances, contract diseases in which the different fluids become altered, and capable of producing serious diseases. The disease of which we speak occurs principally in warm and moist seasons, in animals that have been fed upon hay rapidly dried in the sun after having been wet, or that which is covered with slimy matter and dead insects. In such animals, suffering from a gangrenous fever, or other severe disease, the skin is covered with pustules, and the blood and flesh become putrid, and cannot be touched in general by man without communicating to him an infection. It is, however, necessary to be observed, that the malignant pustule is not always contagious.

Symptoms of the Malignant Pustule.

86. Two varieties of this disease have

been observed. The prominent and the depressed. *

The prominent Variety.

First Period. — Troublesome but slight itching, confined to a circumscribed spot, without redness, heat, or tension of the skin; a sharp but transitory prickly sensation; by degrees the cuticle is raised, and forms a blister of the size of a millet-seed, which quickly increases, and becomes brownish. The itching returns from time to time, and the patient scratches and breaks the little blister which covers the focus of the evil; two or three drops of reddish serous fluid escape, and the itching ceases for a few hours.

Second Period. — A small moveable tumour is formed, which is hard, circumscribed, and flattened, having commonly

* The description of this variety has been given with the greatest exactitude by Professor Chaussier and M. Enaux, and we think we cannot do better than borrow their account. AUTHOR.

the form and size of a lentil. The colour of the skin is not yet changed, except in the centre, and under the first vesicle; this is generally of a citron colour, livid and gangrenous. The itching becomes sensible and more frequent, and is accompanied with a sensation of heat, which increases to an intense degree; then the skin swells, its surface appears tense and shining, the under or mucous membrane swells and forms round the central part a circle more or less prominent and broad, sometimes pale, reddish or livid, sometimes orange, or clouded with different colours, but always superficial; little blisters arise from point to point, which are at first distinct, but ultimately join, and are filled with a reddish matter. The central tubercle, which forms the primitive tumor, changes its colour, becomes brownish, very hard and insensible; it is a gangrenous point, which suddenly increases. This period, which generally lasts but a few hours, sometimes proceeds much slower, and continues for some days.

Third Period. — The evil does not now confine itself to the skin, but by degrees penetrates much deeper; the centre of the tumor becomes harder, deeper, and entirely black; the gangrenous point gradually extends; the little blisters which always surround it announce and precede the progressive steps of mortification. This circle advances and enlarges by degrees, and forms around the primitive nucleus a sort of collar or rim, which makes it appear depressed, and creates a second tumor, compact, but less hard and still sensible. There arises in the mean time a considerable swelling, which frequently extends very far, is elastic and resisting, and gives rise to a sensation of strangulation and stupor in the part: gangrene at the same time continues to make progress. If the subject be strong and robust, the treatment methodical and early commenced, this third period lasts four or five days. The disease begins to be arrested, the swelling loses by degrees that state of tension which characterised the

irritation, the circle of blisters takes a more lively colour, the true inflammatory character is clearly marked in it, the patient feels in the parts a gentle heat with repeated pulsations, the gangrene is confined, and a red circle forms around the tumor; an abundant suppuration arises, removes the eschar, and thus terminates the disease: but in weak persons the disease continues to make a rapid progress, and the infection becomes general.

Fourth Period. — When the disease has attacked in succession the different membranes of the skin *, the pulse is contracted, is more or less frequent and unequal; the skin is dry, the tongue parched and brownish; the heat appears moderate, yet the patient feels an internal

* The skin, though apparently a simple membrane, is in fact laminated, consisting of several subdivisions; the outermost is termed the epidermis, scarf-skin, or cuticle; the second has no English name, being known only to anatomists, and is called *rete mucosum*: after these two are removed, we come to the surface of the true skin itself. TRANS.

heat which torments him to an intolerable degree; he frequently requires drink, and nothing can slake his thirst; he is always in a state of exhaustion; he suffers greatly from pains in the stomach, which are sometimes very acute, and are attended with nausea. In certain cases, the respiration is short, and interrupted by sobs and hiccup; the little urine discharged is thick, and deposits a sediment like brick-dust; looseness, excessive sweats, and bleeding rarely occur. If the disease proceeds to its last stage, derangement of the mind takes place, and the patient falls into a state of low delirium; all the local symptoms increase in violence; the swelling becomes enormous, and the patient dies in a state of gangrene, diffusing the most fetid swell.

Depressed Variety.

This begins with a violent itching, which lasts for several days. On the second day, a black point is seen similar to a flea-bite. The following day, little

blisters are formed, which are circumscribed and regular; a sense of heat, pain, and numbness, is felt in that part of the stomach which is below the eruption. The patient suffers from weakness and unavailing inclinations to vomit; and the pulse is contracted; then the blisters break, and a reddish fluid oozes out. A portion of the skin is seen below as black as charcoal; this adheres to the adjacent parts; there is, however, but little swelling. On the fifth day, there is great distress of mind, with frequent swooning. On the sixth day the patient is delirious, the local swelling and gangrenous state are strongly marked, and at last death takes place. This variety has been described by M. Davy la Chevrie, and is more dangerous than the preceding.

Treatment.

87. In the treatment of the malignant pustule, our object is only to circumscribe, in as small a space as possible, the little

tumour which is the focus of the gangrene, and has the greatest tendency to extend itself to the adjacent parts. Scarifications and caustics are employed with great success to effect this object: internal remedies are not always necessary.

Scarifications, or little incisions made with a lancet or bistoury, are not indeed sufficient to cure the disease, but are useful as they favour the action of other remedies. They ought not to be too superficial nor too deep; they ought to include all the mortified parts, but ought not to extend beyond.

Caustics. — Among these, butter of antimony, oil of vitriol, lapis infernalis, and the actual cautery (red hot iron), are to be preferred. But their employment, as well as that of scarifications, is to be modified according to circumstances. We shall describe the treatment adapted to each of the four stages of the disease, which have just been detailed.

First Stage. — If the disease be still in the first period, open the blister, and after

the drying up of the fluid which oozes out, dip a little ball of lint, about the size of a pea, into some butter of antimony, or oil of vitriol, &c., and place it upon the centre of the blister, retaining it there by a piece of lint and adhesive plaister, and cover the whole with a proper bandage.

At the end of five or six hours the dressing is to be removed, and upon the hard dry scab a pledget of lint smeared with the stimulating digestive, of which the composition is given § 89., is to be placed. The following day renew the dressing, if there be no hardness, nor circle of little blisters, nor acute pains; for it is then evident that the caustic has sufficed to restrain the progress of the disease. The same dressing must be daily continued till the eschar falls off, and when this takes place dress the ulcer with lint steeped in a solution of alum or lime, &c.

Second Stage.— We must have recourse to scarifications if, after the application of the caustic, there should be formed around the eschar a hard tumor with a

circle of little blisters; if the swelling become considerable, incisions must be made in several directions, and they should extend a little beyond the mortified parts; raise a portion of the eschar so as to soak up all the stagnant matter, and then cauterize the part well with one of the caustics, § 75., leaving a small piece of lint steeped in the caustic within the hollow. At the end of a few hours remove this dressing, and apply the digestive, § 89. The following day wash the wound with a little brandy mixed with water, in which a small quantity of salt has been dissolved, or with the collyrium of Lanfranc, § 90.; then apply the digestive and a compress steeped in the decoction, § 91. The dressings are to be renewed until a line of separation is observed between the living and the dead flesh; lastly, if necessary, the internal remedies prescribed § 88. are to be given.

Third Stage. — If assistance is not called for until the third period, when the eschar which forms the centre of the

tumor is extremely hard, and the swelling very considerable, a deep and extensive incision should be made so as to raise and remove every portion of the eschar which might oppose the action of the caustic; the application of which is to be made in the manner we have already directed. The first dressing should be with the stimulating digestive, § 89., applying thereupon the camphor liniment, § 92. The whole limb should be covered with cloths steeped in the anti-putrid decoction, § 93. The dressing must be renewed every twelve hours, till the wound puts on a healthy appearance, when it may be dressed with lint soaked in some spirituous and slightly stimulating fluid.

Fourth Stage.—If the disease be in its fourth stage, the eschar *dry and compact*, and the surrounding parts denote the approach of humid gangrene, the treatment must be commenced by scarifications, but managed so as not to cause a great loss of blood, which would exhaust the patient; a caustic must then

be applied. The oxymuriatic acid is the best in this case, and is to be employed in the same manner as butter of antimony. When the ulcer has been well cauterised with the oxymuriatic acid, or the lunar caustic, apply a poultice of powdered bark and camphorated spirits of wine, and cover the whole with lint smeared with the camphor liniment, § 92. Moisten the dressings frequently with the anti-putrid decoction, § 93. Renew the poultice every six hours, until the eschar begins to separate; the dressing may then be either the digestive, § 89., or the collyrium, § 90.

When the eschar is *soft* and *putrid*, continue the use of the bark poultice; but instead of the simple camphorated spirits, use the anti-putrid decoction for this and for the lotions.

Internal Treatment.

88. Lemonade, or vinegar and water, is in general sufficient during the first and second stages of the disease. The patient should abstain from stimulating food.

In the third stage, if the pulse be small and trembling, accompanied by sudden twitching, and the swelling hard and compact, the opiate § 94. should be given. If, on the contrary, the pulse be loose, the swelling soft and extensive, and retaining the mark of the finger when pressed, and the eschar moist, the acidulated bark decotion, § 95., must be given. The patient ought to observe the most strict regimen; he ought only to take toast and water, barley water, or thin gruel; old wine, or beer mixed with water and lemonade, may be useful.

If the patient has much nausea, if his tongue be white and charged with a thick but *soft* and *moist* fur, and if there be a yellow deposit from his urine, give an emetic; but if the tongue be red, and charged with a *dry*, *black*, and *scaly* crust, and the urine has no deposit, omit the emetic. The nausea felt in this case arises from irritation, to remedy which the anti-putrid and acidulated decoction, § 95., must be had recourse to.

The Remedies employed in Malignant Pustule.

89. *Stimulating Digestive.*

Honey, or honey of roses - - 1 ounce
Verdigris, in fine powder - - 2 drs.
Powdered myrrh - - - - 1 dr.
The yolk of an egg.

Let these substances be accurately mixed. This ointment hardens the eschar. When the eschar is soft, and tending to putrefaction, its activity may be increased by the addition of two drachms of spirit of turpentine, or by augmenting the verdigris.

90. *Collyrium of Lanfranc.*

White wine - - - 18 ounces
Prepared orpiment - 2 drachms
Verdigris - - - - 4 drachms
Myrrh - - - - - 48 grains
Aloes - - - - - 48 grains

Reduce these to a fine powder, and add the wine by degrees.

91. *Decoction.*

Boil in a quart of water a handful of one or other of the following: — elder flowers, camomile, balm, mint, or water germander; and add one-fourth part of brandy, and two ounces of common salt, or of sulphate of potash. Sal ammoniac is not to be used.

92. *Camphorated Liniment.*

Camphor - - - 1 ounce
The yolk of two eggs.
Let these be well rubbed together; then add two ounces of honey.

93. *Anti-putrid Decoction.*

Peruvian bark - - - 1 ounce
Camphorated spirit of wine 4 ounces
Muriate of soda - - - half an ounce.
Boil the bark in a quart of water, and add the two other substances.

94. *Opiate Electuary.*

Powdered bark - - 1 ounce
Camphor - - - - 1 drachm
The yolk of an egg.

Mix the camphor with the egg, then add by degrees the bark with a sufficient quantity of syrup of lemon to form an electuary, which divide into eight parts, and let one be taken every three hours.

95. *Acidulated Decoction of Bark.*

Boil one ounce of bark in a pint and a half of water, reduce it to a pint, and strain; then add two ounces of syrup of lemon and some sulphuric acid, drop by drop, till the fluid acquires a pleasant acidulated taste. Give a glass of this decoction every three hours, or even more frequently, if symptoms of putridity are very manifest.

OF THE BITE OF MAD ANIMALS.

96. It has been fully proved that men, horses, asses, oxen, pigs, and much more

frequently foxes, wolves, cats, and dogs, *become mad without having been bitten.* Many causes may occasion this dreadful disease; but in general it is most prevalent during excessive hot summers and very cold winters.

Canine madness is almost always occasioned by the bite of a mad animal; however, it may be caused by the saliva of such an animal applied to any part where the skin is *abraded.*

Signs of Madness in Dogs.

According to Messrs. Enaux and Chaussier, the disease begins by the dog being languid, and more dull than ordinary; he seeks for obscurity, remains in a corner and ceases to bark; but growls incessantly at strangers, and that without any apparent cause. He refuses food and drink, his walk becomes vacillating, like that of a person almost asleep; after two or three days he walks like a drunkard, and frequently falls. His hair stands erect, his eyes fixed and haggard, his

head hangs down, his mouth is wide open, and contains much frothy saliva; the tongue is protruded, and tail turned inwards; he avoids water, which appears to redouble his distress; he suffers from time to time an increase of fury, and endeavours to bite every object, not excepting his master. The light, together with vivid colours augment his rage. At the end of thirty, or thirty-six hours, he dies in convulsions. The dead body putrefies in the most rapid manner, and diffuses a most infectious odour; it ought not to be left exposed above ground, lest it should be eaten by other animals, which might in consequence become mad also. The hole into which the body is put should be very deep, and every part of the place in which he has been confined well washed with lime-water, and also the vessels from which he took his food. The person who touches his body should wash himself well with vinegar.

Treatment.

97. A person bitten by a mad animal rarely experiences any symptoms before the thirtieth or fortieth day. The treatment, however, should commence immediately after the accident.

1st. The individual should be stripped, and the clothes put into water, to prevent contagion.

2d. The wound should be allowed to bleed, and pressed in different ways, so as to favour the flowing of blood; it should then be washed with warm water, in which salt or soap has been dissolved. If the wound be small, but deep, it should be enlarged; but if only the skin has been raised, this operation is not requisite. It may be necessary to observe, that the wound often appears slight, although the poison has penetrated deeply.

3d. After the wound has been washed, it should be rubbed with a hard cloth, so as to irritate it, and cause blood to flow; it would even be useful to apply a cupping-glass.

4th. The wounds, and even the scratches, should be cauterized with one of the caustics mentioned § 75.: but the hot iron, butter of antimony, or oil of vitriol, is to be preferred. The cauterization ought to be extensive and profound; if slight, it is insufficient to prevent the disease, and nothing is to be apprehended from the use of the caustics. If the wounds are numerous they should be cauterized one after the other, beginning with those of the head and face, and leaving an interval of a day between each.

5th. Six or seven hours after the cauterization, apply some of the blistering plaster indicated § 100.; at the end of twelve hours remove this, and open the bladder formed; dress the wound twice a day with the cerate § 101., spread upon a soft leaf, or piece of rag. When the eschar falls, which usually occurs from the fifth to the eighth day, the wound may be healed, provided it appear that the cauterization has been more profound than the injury inflicted by the tooth of

the animal; if the contrary be the case, cauterize anew, and when the second eschar falls, the suppuration is to be maintained for forty or fifty days; to effect this, put a pea, bean, or a piece of gentian, or orris-root, into the wound; and dress it with the blistering cerate, § 100.

Precautions to be taken.

98. If the wound be in the head, all the hair should be removed, so as to allow of our examining and cauterizing the wounds. If inflammation and swelling follow the cauterization, emollient fomentation must be used, and the part dressed as if it were a simple wound.

When the lips, cheeks, or eyelids, have been bitten, the caustic must be applied so as to penetrate very deeply, and the suppuration maintained a long time. The cauterization of the eyelid requires some precautions. It should be raised as much as possible from the eye, and

the edges of the bite touched with a piece of lint soaked in the caustic; it will be convenient to affix the lint to the end of a bit of wood. If the saliva has been applied to the globe of the eye, the caustic must be passed gently over the part by the aid of a fine pencil. There is no other danger in so doing than that of producing a slight inflammation, and a more or less considerable flow of tears. In this case, the eye must be washed with a decoction of linseed, or mallow-root, or gum-water, to which a few drops of laudanum have been added. If the wound has been in the mouth, it should be washed with vinegar and water, and then cauterized with a hot iron; the liquid caustics would have the inconvenience of mixing with the saliva, and extending their action over the surrounding parts.

When the wound is near an artery, and we plainly see or feel its pulsation, we must confine ourselves to touching the surface slightly with a pencil dipped in butter of antimony; by this means we

avoid rupturing the artery, and consequently have no fear of hemorrhage, which, without this precaution, would take place when the eschar became detached. There will be some danger in cauterizing the bite in the manner just directed, if, in place of being covered with a portion of muscle or cellular membrane, the artery should be bare; all that can then be done, is to put a small quantity of powdered cantharides, or some acrid ointment, upon the wound.

If some time has intervened since the bite was received, and we have the certainty that the animal was mad, the part must be opened without delay, cauterized with hot iron, and the suppuration maintained some time.

Enaux and *Chaussier.*

On the Employment of Oxymuriatic Acid.

M. Brugnatelli has reported a number of facts which tend to prove that when oxymuriatic acid is applied to wounds

caused by the bite of mad animals, it prevents hydrophobia from taking place.

Clauzel had announced, a long time before this, that the internal use of the same remedy had saved several persons bitten by a mad wolf. While waiting for further experience upon the advantages of this medicine, it is of the highest importance to cauterize the wounds in the manner we have just directed.

Internal Treatment of the Bite of mad Animals.

99. During the first few days, perspiration is to be promoted by the use of volatile alkali, as prescribed § 76., when speaking of the viper. In cases where the wound is much inflamed, and very painful, substitute for this a decoction of linseed or mallows, or Dover's Powder, § *101. If the pulse be hard and full, bleed the patient. Emetics and purgatives must be given if the stomach be loaded, the tongue furred, and the mouth clammy. Moderate exercise and light

food should be prescribed; but if there is much fever, the strictest regimen must be ordered.

On the Efficacy of the Water Plantain (Alisma Plantago), as a Remedy for Hydrophobia.

It has been stated that many persons attacked with hydrophobia have been cured by the water plantain, washed, dried in the shade, and mixed with bread and butter. Two cows attacked with hydrophobia were treated with this plant; the one ate but a small quantity, and died; the other, which had consumed a much larger quantity, was entirely cured. These facts, however surprising, may be exact; experience alone can enlighten us; in the mean time, we are justified in advising that ten or twelve grains of the root of this plant should be given immediately after the wound has been cauterized, and repeated at the end of two hours; in such a dose, the remedy is without dan-

ger, and may perhaps prove of some utility.

Remedies directed to be used in the Treatment of Hydrophobia.

100. *Blistering Plaster.*

Yellow wax - - - 4 ounces
Turpentine - - - 6 drachms
Olive-oil 1 ounce and 2 drachms.

Melt these by a gentle fire; and when nearly cold add

Cantharides, in fine powder - - - } 3 ounces.
Mastic - - - - - - 2 drachms.

This plaster may be replaced by one prepared, by incorporating six drachms of powdered cantharides, with a paste formed of the crumb of bread and strong vinegar.

* 100. *Blistering Cerate.*

Powdered cantharides - half a drachm
Cerate - - - - - - 1 ounce.

Mix these thoroughly.

101. *Simple Cerate.*

White wax - - - 1 ounce
Olive-oil - - - - 2 ounces
Spermaceti - - - 2 ounces.

Melt these together over a gentle fire.

* 101. *Dover's Powder.*

Ipecacuanha - - - - half a drachm
Extract of opium - - - half a drachm
Sulphate of potash, 1 drachm and a half.

Let these be reduced to a fine powder, and intimately mixed.

From 12 to 24 grains of this powder mixed in honey should be given every night.

Treatment for Animals.

Oxen, sheep, and horses, when bitten by a rabid animal, suffer the same symptoms as man, but with much more rapidity.

If the tail or ear has been bitten, the part should be removed, and the wound cauterized with a hot iron, and then dressed with the digestive mentioned in the next page.

When the bite has occurred in a situation where the injured part cannot be removed, the hair must be shaved off, and the wound enlarged with a bistoury; after which, let it be well cauterized, and dressed with the following

Turpentine Digestive.

Turpentine - - - 2 ounces
Olive-oil - - - - 2 ounces
The yolk of two eggs.

Mix the turpentine well with the eggs, and add the oil by degrees. When we are desirous of increasing the suppuration, half a drachm of caustic potash may be added. The wound ought not to be allowed to heal till after the lapse of several weeks. It may be sprinkled from time to time with powdered cantharides, or touched with caustic.

The person who dresses the animal ought not to forget to wash his hands well with soap and water, or vinegar and water. After the death of the animal, the skin must not be taken off, lest the disease should be thereby communicated.

ASPHIXIA. *

THERE are various species of asphyxia enumerated by different authors: we have judged it necessary to detail the symptoms and treatment of the following:

1. That caused by the fumes of burning charcoal.

2. That caused by the exhalations from lime-kilns, and cellars where wine or other liquors are in a state of fermentation; and that which takes place in marshes and mines.

3. That occasioned by exhalations from privies and common sewers.

4. That arising from the want of respirable air.

5. That from immersion in water.

6. That from strangulation.

7. That from excessive heat.

* The state of the body during life, in which the pulsation of the heart and arteries cannot be perceived. Asphyxia is compounded of α, negative particle, σφυξια, a pulse.

8. That from cold.
9. The asphyxia of new-born infants.

I. OF ASPHYXIA FROM THE FUMES OF BURNING CHARCOAL. *

102. Persons in a state of asphyxia from the fumes of burning charcoal, feel a great heaviness in the head: intolerable singing in the ears; great disposition to sleep, so great a loss of strength as to be unable to support themselves upright; a dimness of sight; excessive pain in the head; great difficulty of breathing, and violent palpitation of the heart, followed by a suspension of the respiration and circulation. The senses no longer exercise their functions, and sensibility appears extinct; the limbs are sometimes flexible, sometimes stiff and contracted; the heat of the body is natural; the face is sometimes red or violet, at other times it is pale and very

* If during the burning of charcoal moisture be present, a gas is evolved, which is peculiarly fatal to life. Trans.

livid; sometimes the evacuations take place involuntarily. It is not in all cases that every symptom we have enumerated occurs.

Treatment.

103. — 1st. Begin by exposing the person to the air without any regard to cold, which, in these circumstances, can never be hurtful; remove all the clothes, and place him upon his back, with the head and breast somewhat elevated, so as to promote respiration.

2d. On no account administer tobacco fumigations, or place the sufferer in a warm bed.

3d. Give a few small glasses of lemon-juice and water, or vinegar weakened by the addition of three parts water, and sprinkle the body, particularly the face and breast, with cold vinegar. After this rub the body with clothes steeped in vinegar, camphorated spirits of wine, or any other spirituous fluid; at the end of two or three minutes, wipe the parts which have been wetted with a warm

towel, and after the interval of two or three minutes, recommence the sprinkling and rubbing with cold vinegar or spirits. These means ought to be continued with perseverance.

4th. Irritate the soles of the feet, palms of the hand, and the whole course of the back, with a hard hair-brush.

5th. Administer a glyster with one part vinegar and two parts water; after a few minutes administer another prepared with two or three ounces of common salt, and one ounce of Epsom salts dissolved in water.

6th. Irritate the nostrils by the vapour from burning matches, or of volatile alkali *; or the nostrils may be irritated by a little roll of paper or a feather. †

* Observe carefully that the phial which contains the volatile alkali, is not retained too long a time under the nose. See § 11.

† Applications of this kind to the olfactory nerves rouse the living principle, and put the muscles of respiration into action, while some applications to the mouth rather depress than rouse, by producing sickness. TRANS.

7th. Inflate the lungs by the method described in the following page.

8th. If, notwithstanding the employment of these means, the person continue in a state of insensibility; if he retain the natural heat, if his face be red, his lips swelled, and his eyes as it were starting from their sockets, he should be bled in the foot, or rather in the jugular vein. This is preferable to emetics, which have been given in these cases, and have often proved more injurious than beneficial.

9th. When the person is restored to his senses, he may be put into a warm bed, in an apartment having the windows open. All useless persons are to be excluded. He may then take a few spoonfuls of some good wine, such as Madeira or Sherry; the wine may be warmed, and a little sugar added. The anti-spasmodic mixture § 7., may also be given.

10th. Emetics ought never to be given to persons in a state of asphyxia, except in the case of those, who, after having recovered their senses, suffer from excessive nausea, heaviness of the stomach, &c.,

and even then, it is far better to have recourse to purgative and irritating glysters, prepared with common or Epsom salts.

11th. The succours we have just advised ought to be administered with the *greatest promptitude*, and continued a long time, although *the individual may appear dead.* It has often happened, that five or six hours have elapsed before persons have been restored from a state of apparent death; and it is necessary to insist upon the introduction of air into the lungs.

Method of introducing Air into the Lungs.

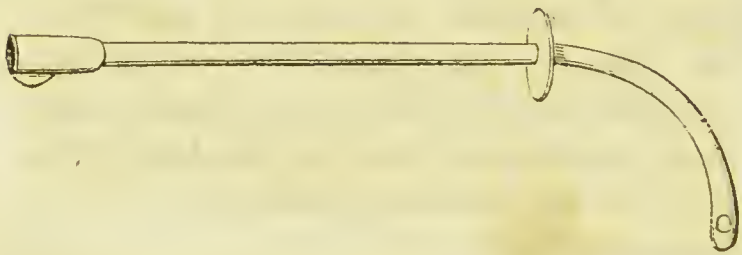
104. The frequent occurrence of the necessity of introducing air into the lungs of persons in a state of asphyxia, has led to the suggestion of various methods of effecting this object. We shall mention some of these, beginning with the one which appears to us to claim the preference.

1st. After depressing the base of the tongue with the middle finger of the left hand, introduce into the larynx or

windpipe the small extremity of the "laryngean tube of Professor Chaussier*;"

* The laryngean tube is conical, seven or eight inches in length, and resembles a common *sound.* It should be made of silver or copper; its large or upper extremity, sufficiently wide to admit the end of a pair of bellows or a bladder; the smaller extremity, which is to enter the larynx or windpipe, is flattened, and pierced with two long oval holes. At about an inch and a quarter from this end, the instrument is curved; and immediately above this curvature is placed, in a transverse direction, a small plate of metal, to which is affixed a piece of buffalo skin: by this means, the opening of the larynx is completely closed, and the air thrown in must necessarily dilate the lungs.

As the original has no engraving, the translator conceived the work would be rendered more valuable by such an addition.



The tube itself may be had at Mr. Evans', No. 10. Old Change, St. Paul's Church-Yard.

then press lightly upon the tube, so as to place the piece of leather affixed to its sides upon the opening of the larynx, and then draw up the mucous matter which may be contained within the windpipe. A small pair of bellows, or a bladder of air, should then be attached to the upper extremity, and air thrown into the lungs by small quantities at a time, and at short intervals, so as to imitate the natural process of respiration. At the same time, let the chest and stomach be rubbed with a piece of flannel.

2d. In default of this instrument, air may be introduced into the lungs, by the pipe of a pair of small bellows inserted into one of the nostrils, the other being kept firmly closed. It is still better to introduce a common *sound* into the larynx, by passing it through one of the nostrils, and then adapting to it the end of the bellows.

3d. If these means of inflating the lungs cannot be accomplished, we must

have recourse to the application of the mouth, to that of the sufferer. *

4th. We ought not to make any incision into the trachea, although this expedient has been recommended; for experience proves, that air directed into the lungs by this means, finds an exit again by the opening made in the larynx, and consequently contributes in no degree to the dilation of the lungs.

II. ON ASPHYXIA CAUSED BY THE EXHALATIONS FROM LIME-KILNS AND FERMENTING LIQUORS, AND THAT WHICH TAKES PLACE IN MARSHES AND MINES.

105. The symptoms of this species of asphyxia, and its treatment, are similar to what has already been said respecting that arising from the fumes of charcoal.

See § 102. and 103.

* The medium of a handkerchief may be used, to render the operation less indelicate. Trans. (See Appendix.)

III. ON ASPHYXIA OCCASIONED BY EXHALATIONS FROM PRIVIES OR COMMON SEWERS.

106. The asphyxia occasioned by exposure to the exhalations of privies and common sewers is principally caused by sulphuretted hydrogen; for this gas, even when mixed with a large quantity of atmospheric air, is a very potent poison.

When the exposure has continued but a short time, the sufferer experiences a general uneasiness accompanied with nausea and sickness. His respiration becomes irregular, but not difficult, and his pulse much agitated. The skin is cold; general convulsions take place; the muscles of the chest and face being particularly affected.

In cases where a person has been long exposed to the action of the deleterious gas we are speaking of, all power of motion and sensation is lost; a frothy saliva, tinged with blood, flows from the mouth; the lips and face are livid; the eyes are shut, and void of all brilliancy, the pupil fixed and dilated. The pulse is

small and frequent, and the respiration short, difficult, and apparently convulsive; the action of the heart becomes disordered and violent; and the extremities are in a state of relaxation. To this state succeeds an agitation more or less excessive.

On some occasions we observe, in addition to the above detailed symptoms, that the muscles are attacked by alternate spasms and convulsions, and the body is curved backward; the individual appears to suffer acute pain, and utters a cry somewhat similar to the bellowing of a bull.

Treatment.

1st. Exposure to cold air, sprinkling or effusion of cold vinegar and water, and frictions with a hard hair-brush, are the first means of resuscitation to be resorted to in cases of asphyxia from the vapour of privies or drains. In speaking of the asphyxia from charcoal fumes, we have detailed how these are to be administered. See § 103.

2d. If it be possible to procure the oxygenated muriatic acid gas, the patient should be made to inspire the vapour; but care must be taken that this be not continued too long, lest the lungs be injured. This remedy is especially useful when it can be speedily had recourse to.

3d. It frequently happens that a portion of fluid has been swallowed, and whenever this is the case the patient should be made to vomit, by giving him a glass of oil, or, what is still better, two grains of tartar emetic, or twenty-four grains of ipecacuanha.

4th. When these means are insufficient, and there exists violent palpitations of the heart, the individual must be bled in the arm, and the blood allowed to flow in proportion to the strength of the individual.

5th. Endeavours should be made to allay the convulsions, spasms, and other nervous affections by the cold bath, and the use of the anti-spasmodic mixture, § 6. After the bath, the patient should be

placed in a warm bed, and the frictions with the hair-brush continued.

6th. Lastly, If in spite of these efforts the individual continue senseless and motionless, sinapisms and blisters ought to be applied to the feet.

IV. ON ASPHYXIA FROM THE WANT OF RESPIRABLE AIR.

108. When a number of persons have remained during a long time in an apartment, theatre, or any other place where the air is not renewed, asphyxia takes place, not only because all the parts of the air which are fit for respiration have been consumed, but also from their having been formed during respiration a quantity of carbonic acid gas, which remains in the place, and acts as a powerful * poison.

* The fatal imprisonment in the black hole, Calcutta, affords a memorable example of this species of suffocation. When Surajah Dowlah reduced Calcutta in 1756, 146 unhappy persons, exhausted by continual action and fatigue, were

Individuals in a state of suffocation from the above cause suffer from an abundant and continued perspiration, attended with an insupportable thirst, and followed by great pain of the chest, difficulty of respiration, and intense fever; they lose their strength, and fall into a deep lethargy, to which death quickly succeeds if assistance be not speedily given.

Treatment.

The treatment of this species of asphyxia does not differ from what has already been prescribed in § 103.

V. OF ASPHYXIA FROM SUBMERSION OR DROWNING.

109. As it is incontestibly proved, that a person may remain a long time in the

---

crammed together in a dungeon about eighteen feet square, where they remained from eight at night till six the following morning, when the poor remains of 146 souls, being only twenty-three, came out alive: but most of them in a high putrid fever. TRANS.

water without life becoming absolutely extinct, it is right to administer the succours we are about to prescribe, however hopeless the case may appear; and as the loss of a moment may be dangerous, the treatment should be commenced the instant the body is taken out of the water.* The unfortunate object should be cautiously conveyed in any vehicle that can be procured, lying upon straw or a mattrass, in as natural and easy a position as possible; the head should be uncovered and a little raised, and the body rather inclined to the side. When no vehicle can be obtained, the body should be carried in the arms of two or more persons.

Treatment.

1st. In removing the body to a convenient place, great care must be taken that it be not bruised, or shaken violently,

* The body is to be first dried, to prevent evaporation; and be re-clothed, to prevent exposure to a cold medium. Vide Report of the Royal Humane Society, Sect. III.

or roughly handled, or carried over the shoulders, with the head hanging downwards, or rolled on the ground, &c. For experience proves, that these methods, formerly resorted to with the view of causing the water to flow out of the stomach, are not merely useless, but injurious; and that they often destroy the small remains of life.

2d. Every part of the body should be carefully examined, in order that we may be assured whether or not there is any mortal wound: for in such a case, all succours would be useless. But we must not decide upon abandoning the unfortunate object of our care, until the existence of such a wound is ascertained.

3d. All the wet clothes being removed, and the body well dried, it should be placed on a low bed, and on the right side, the head and shoulders being raised in a small degree; the mouth may be opened, to allow of the discharge of any fluid which may be left therein.*

* The windows or door of the room should be left open, and no more persons admitted into it

4th. The subject being placed in this situation as speedily as possible, various stimulating processes should next be em-

---

than what are absolutely necessary; as the life of the patient greatly depends upon having the benefit of pure air. Great care must also be taken, that the body be not heated too suddenly. The warmth most promising success, is that of a bed or blanket properly warmed. Bladders, or bottles of warm water, should be laid upon the stomach, at the bottom of the feet, in the joints of the knee, and under the arm-pits; and a warming-pan moderately heated, hot bricks wrapped in cloths, or bags of hot ashes or sand, should be rubbed over the body, particularly in the direction of the spine. The natural and kindly warmth of a healthy person lying by the side of the body has been in some cases, particularly those of children, very efficacious. The shirt or clothes of an attendant, or the skin of a sheep fresh killed, may be also used with advantage. Should these accidents happen in the neighbourhood of a warm bath, brew-house, bake-house glass-house, salter's, soap-boiler's, or any fabric where warm lees, ashes, grains, sand, water, &c. can be easily procured, it would be of the utmost service to place the body in any of these, moderated to a degree of heat very little exceeding that of a healthy person. TRANS.

ployed. Volatile salts, spirits of hartshorn, the fumes of burning sulphur, or other stimulating substances, should be applied to the nostrils; or they may be irritated with a feather, or other light body.

5th. But, above all, endeavours are to be used to inflate the lungs by the methods suggested § 104.

6th. General frictions * should be employed, with warm flannels, a dry brush, or even with the hand; and after the use of these frictions, we may apply a flannel steeped in camphorated spirits, vinegar, &c.

7th. A glyster prepared, with four ounces of common salt and a pint of

* Friction is a measure to be employed; but as its principal use appears to be that of moving the blood onwards towards the heart, we should be very careful of adding to the burthen under which that organ labours. It should therefore at first be used as a means of increasing warmth; and subsequently when the lungs have been successfully inflated for some time, as a means of assisting the circulation of the blood. Vide Report of the Royal Humane Society, Sect. III. TRANS.

water, or three parts of water and one of vinegar, may be administered. *

8th. The injection of tobacco infusion, or smoke, as recommended by some authors, is not only useless, but may even have a very deleterious effect.

9th. If the person remain senseless, if his face be red, livid, or black, and his limbs warm and flexible, he ought to be bled in the foot, or, what is better, in the jugular vein; but if the body be cold

* Or a pint or more of water, with the addition of one or two spoonfuls of spirits of hartshorn, a heaped spoonful of mustard, or a table spoonful of the essence of peppermint; in defect of one or other of these, half a gill or more of rum, brandy, or gin may be added; or the warm water given alone.

This step, however, need not be taken, until artificial respiration has been begun; for it will answer but very little purpose to stimulate the heart through the medium of the intestines, unless we at the same time supply the left cavity of the heart with blood fitted to act upon it; which we cannot do without first removing the collapsed state of the lungs, and promoting the passage of the blood through them by a regular inflation. Vide Report of the Royal Humane Society, Sect. III. TRANS.

and the limbs stiff, this remedy must by no means be had recourse to.

10th. If there be no signs of returning life, such as sighing, gasping, twitching, convulsive motions, &c., little pieces of cork, linen, or paper, should be lighted and placed upon the pit of the * stomach, the arms and thighs.

* As the stomach is a highly sensible part, and intimately connected with the heart and brain, the introduction of some moderately warm and stimulating liquor into it seems well calculated to raise the dormant powers of life. This is conveniently done by means of a syringe and flexible tube. (See page 164.)

Till the power of swallowing is pretty well restored, it will be dangerous to attempt getting fluids down the throat in any other way. The quantity thrown in ought not to exceed half a pint, and may be either warm negus or water with the addition of a little spirits of hartshorn, mustard, or essence of peppermint. When the patient is so far recovered as to be able to swallow, he should be put into a warm bed, with his head and shoulders somewhat raised by means of pillows. Warm wine, whey, alepposset, or other light and moderately nourishing food should now be given, and gentle perspiration promoted, by wrapping the feet and legs in flannels well wrung out of warm water. Vide "Observations on apparent death from drowning, &c." by Dr. Curry. TRANS.

11th. If the substances which have been taken internally should occasion nausea, and the tongue and mouth at the same time be covered with white crust, a gentle emetic may be given, § 61., especially if the accident has taken place shortly after a repast. If, on the contrary, the medicines have operated upon the bowels, a few spoonfuls of warm wine may be given.

12th. Lastly, the unfortunate object of our care ought not to be abandoned until there remains no doubt whatever that life is quite extinct. We shall point out in paragraph 116. how real and apparent death may be distinguished. LET THIS CONVICTION REMAIN FIRMLY ON THE MIND, THAT EIGHT OR TEN HOURS ARE HARDLY SUFFICIENT TO RESTORE ANIMATION.

VI. OF ASPHYXIA FROM STRANGULATION OR HANGING.

110. WE ought to employ the same general means of resuscitation for such

as have been hung, as we have recommended for persons drowned, observing, however,

1st. That the head and shoulders be raised higher, and the ligature removed from the neck.

2d. That it is not necessary to take any measures to heat the body, unless it has been exposed to a great degree of cold.

3d. That bleeding is much more requisite in these cases, than in that of drowning.

VII. OF ASPHYXIA FROM HEAT.

111. — 1st. In this case, place the individual in a cool situation.

2d. Remove all the clothes, provided the body be not very cold; in which case, we must confine ourselves to the loosening of every part which may at all impede the free circulation of the blood.

3d. Give a mixture of equal parts of vinegar and water, or lemonade.

4th. Administer a glyster of two or three ounces of common salt, and one

ounce of Epsom salts, dissolved in a pint of water.

5th. Apply six, eight, or ten leeches to the temples, if the insensibility does not diminish.

6th. Practise bleeding in the foot, or, what is better, if the respiration and circulation be much impeded, in the jugular vein.

7th. Follow the directions which have been given in the treatment of asphyxia from charcoal fumes.

VIII. OF ASPHYXIA FROM COLD.

112. When a person has been long exposed to the action of cold, he suffers from a feeling of general numbness, and a sort of intoxication, and quickly falls asleep and becomes quite insensible. It sometimes happens that he returns to his senses without any assistance; but much more frequently does he fall a sacrifice. Our duty is,

1st. To remove him to a convenient place where the necessary aid can be given. If the body be naked it should be covered, but the head left bare.

2d. When brought to such a spot, the body should (if possible) be plunged into the snow, and be rubbed gently with this substance, directing the frictions from the stomach towards the extremities. In a few minutes after, frictions should be applied with cloths steeped in cold water, the temperature of which is to be gradually increased; in a word, *great care must be taken that the body be not heated suddenly*, but slowly and by degrees.

3d. If neither ice nor snow can be procured, we must place the body in a bath of cold water, gradually raising the temperature, and continuing the frictions as directed in the last paragraph; water may also be sprinkled upon the face.

4th. The lips and nostrils should be irritated with a feather, or other light substance.

5th. The lungs must be inflated. See § 104.

6th. Volatile alkali, or the other stimulating substances, should be applied to the nose as directed in page 174.

7th. When the body is restored to a

degree of warmth, and the limbs have become flexible, it should be placed in a dry, but not warm bed, and be rubbed with a brush.

8th. The irritating glysters (page 177. note) are to be administered.

9th. When the power of swallowing is restored, we should give some vinegar and water, mint-water, thin broth, or water with a very small quantity of wine.

10th. Solid food ought not to be allowed until several hours after complete restoration.

Treatment of Frozen Limbs.

113. Persons whose limbs are frozen ought to be treated in the same manner as just directed for those in a state of asphyxia from cold; excepting that only the parts affected are to be placed in a cold bath, and the frictions confined to the same. Give six or seven drops of volatile alkali, mixed with a little orange-flower water.

IX. OF INFANTS BORN IN A STATE OF APPARENT DEATH.

114. INFANTS who are born without any signs of life, may be in a state of *asphyxia*, or *apoplexy*. It is necessary to distinguish between these two cases, since the treatment proper for the one is injurious in the other.

Of the Asphyxia of new-born Infants.

Causes. — The asphyxia of new-born infants may depend on a laborious accouchement, attended with considerable *flooding;* or on the delicacy of the infant; but more frequently it arises from pressure upon the navel-string; and this is most frequent in feet presentations.

Signs. — The infant, which, according to the expression of M. Baudelocque, may be regarded as "without any blood," is pale, discoloured, or livid; the flesh is flaccid, its limbs flexible, and without motion; it is impossible to feel either

the pulsation of the heart or navel-string; it has no respiration, but is to all appearance dead.

Treatment.

However hopeless the state of the infant may be, it is proper to administer, immediately, the following succours:

1st. The navel-string must be left uncut; especially if there exists no bleeding, and the after-birth is not detached, and a slight degree of pulsation is felt in the navel-string.

2d. The child should be placed upon the side, taking care to raise the head, and leaving the face fully exposed to the air; the other parts of the body ought to be covered. The navel-string must not be *pulled*.

3d. The mouth and nostrils must be examined, lest there be any mucous matter or clots of blood, which may prevent the air from entering the lungs; in this case, introduce into the mouth either the finger, a feather, or a piece of

lint steeped in salt and water, and apply it lightly, so as to detach all the matter which may obstruct the passage of the air.

4th. The lungs must be inflated as directed, § 104.

5th. The back and the bottom of the feet should be rubbed with a soft brush; the other parts of the body are to be rubbed with cloths steeped in warm wine; light pressure may be made upon the navel-string, breast, and stomach.

6th. A small glyster should be administered, made with warm water, and a little vinegar, or a few grains of salt.

7th. If these succours be not effectual, the infant must be placed up to its armpits in warm-water, to which a little wine has been added.

8th. A small cupping-glass may be applied.

9th. The application of volatile alkali, concentrated vinegar, and other stimulants, the action of which are very energetic, must be omitted.

10th. The use of these means must be persisted in for a long time, suspended at intervals, and varied in every way.

If the after-birth be detached, and there be no pulsation in the navel-string, the navel-string should be divided; the infant removed from the mother, and assisted in the manner we have before directed.

Of the Apoplexy of new-born Children.

115. The causes of apoplexy in new-born infants, are, a severe labour, compression of the head in the *pelvis*, or by the forceps, or strangulation by the folds of the navel-string.

Signs. — The infant gives no sign of life; is in a profound lethargy and immoveable; the face is black, livid, and swelled; the skin is discoloured; the breast gorged with blood, which appears extravasated: sometimes we observe upon the head a soft tumour, which varies in its size, filled with a serous matter.

Treatment.

1st. We ought immediately to cut the navel-string, so as to allow the blood to flow; and to promote this effect, the chest and stomach must be rubbed with a warm cloth; the head, during this time, must be kept elevated.

2d. One or two leeches must be applied behind the ear, if a copious flow of blood has not followed the division of the navel-string. When leaches cannot be obtained, one of the veins of the head or neck must be opened with a lancet. If there be a tumour upon the head, an incision must be made with a bistoury, and the flow of blood increased by the application of compresses steeped in warm water.

3d. The infant must be plunged into a warm bath, to which some gentle stimulating fluid has been added; wine, brandy, or vinegar may be used. During the time of immersion in the bath, the back must be rubbed with a hot cloth.

4th. The stimulants prescribed for the treatment of the asphyxia of new-born infants may also be employed.

See page 185. Nos. 5. and 6.

ON THE SIGNS OF REAL DEATH, AND THE CAUTIONS TO BE OBSERVED, TO AVOID CONFOUNDING THE DEAD WITH THE LIVING.

116. It has repeatedly occurred, that persons who had been regarded as dead, have returned to life at the moment when they were about to be opened or interred; nor are there instances wanting of persons recovering, even after having been placed in a vault. Hence there cannot be a doubt that many have perished from having been interred with too much precipitation. This horrible mistake arises from the difficulty experienced, in certain cases, of distinguishing real from apparent death. It becomes necessary, then, to examine with care the value of those signs which have been regarded as the surest in establishing the distinction in question.

1st. We esteem one of the most certain signs of death to be *the stiffness of the corpse;* but as rigidity takes place in certain diseases, even during the life of the individual, it is necessary to mark distinctly the characteristics of the two kinds.

A. A very considerable rigidity may occur in a person that has been frozen, but not yet dead, and consequently in a state to be restored. The rigidity cannot be confounded with that which is the invariable result of death, because we are aware that the body has been exposed to the action of cold; and especially because it is very general; for, in fact, the skin, the breast, the abdomen, and all the organs offer an equal degree of hardness with the muscles; which is not the case in cadaverous rigidity, where it is only the muscles that present a great degree of resistance. Further, when we press hard with the finger upon the skin of one who has been frozen, we form a hollow which is a long time in disappearing, and

when we change the position of an extremity, we hear a little noise that arises from our having broken the particles of ice attached to the displaced member.

B. The rigidity to which the late M. Nysten gave the name of *convulsive*, and which sometimes takes place in severe nervous diseases, will be easily distinguished from the cadaverous rigidity. When a limb is stiff from tetanus, convulsions, &c., there is the greatest difficulty in changing its position; and when this is effected, the member quickly resumes its first position. This is not the case in cadaverous rigidity; the member when moved does not resume its first position.

C. The rigidity which occurs in certain cases of syncope, cannot be confounded with cadaverous rigidity: in syncope, the rigidity takes place immediately after the disease commences, the chest and abdomen still retain their heat. The cadaverous rigidity is not observed till some time after death, and when the

heat of the body is no longer sensible to us.

D. The rigidity observed in some species of asphyxia (or apparent death), may be easily distinguished from cadaverous rigidity. Let us suppose a person in this state from suffocation, from inhaling noxious vapour, &c. and we find a degree of rigidity in his limbs, we must recollect that it is impossible for this rigidity to be the result of death, since the bodies of those who die in a state of asphyxia of only a few minutes' duration, do not become stiff till after the lapse of several hours.* It is impossible for a person to remain alive in a state of asphyxia more than twelve hours; beyond this period, the body begins to lose its natural heat: now, if we are certain that the person has been in this state more than twelve hours, either from strangulation, or from having inhaled noxious gases, and the body be

* In proportion as the death has been sudden, the cadaverous rigidity is slow in commencing.

cold, we can have no doubt of the rigidity being strictly cadaverous.

2d. If, from any cause, the body of an individual that we believe to have been dead for some time, should be still supple, although cold, we ought not to inter it till after farther examination; for it ought, at all events, to offer a degree of rigidity. Before deciding whether the individual be really dead or not, one of the muscles of the arm or thigh should be laid bare and electrified by means of the galvanic pile. If there be no sign of contraction, life is certainly extinct; on the contrary, if this effect be apparent, the individual is not dead, and we ought to endeavour to restore the movements of the heart and lungs by the means indicated. Article Asphyxia, § 103.

3d. The most certain sign of death is decided Putrefaction; but is it prudent to wait till this be fully developed, before proceeding to the interment? This practice is dangerous for the assistants, and ought to be relinquished. The commencement of putrefaction has been con-

sidered by some as sufficient to prove that the individual was dead, and that the body ought to be interred quickly after this sign has declared itself. We are of this opinion; *but we judge it right to point out, that it does not belong to the uninformed to decide, whether there be or not a commencement of putrefaction; the physician alone can establish the fact.* How many times have we seen persons recovered by the aid of appropriate succours, who were believed to be dead, from exhaling an offensive odour, and having several violet spots upon the skin, with other signs of putrefaction? In some cases these have arisen from the putrefaction of an extremity.

4th. The cadaverous state of the face, spoken of by Hippocrates, has been regarded as a sign of real death. The following is the description given by him: the forehead is dry and wrinkled, the eyes are hollow; the nostrils are sharp, edged with a violet or blackish coloured circle; the temples are low, the ears erect, the lips hanging down, and the cheeks pressed

in; the chin hard and wrinkled; blue or livid colour of the skin; the eye-lashes and hair within the nostrils are covered with a yellowish white powder. Taken singly, this latter sign is of no value, since it is often seen in individuals twenty-four or forty-eight hours before death; and, on the other hand, it is generally absent in cases of sudden death.

5th. The softness, sinking, flaccidity, and cloudiness of the eyes have been regarded by some celebrated physicians as a certain indication of real death. If it be true that, in general, the eyes sink and become tarnished after death, it is equally certain, that this does not always take place; and on the other hand, it sometimes occurs during the life of the individual; consequently, this sign is insufficient to establish the reality of death, when taken exclusively.

6th. The impossibility of feeling the pulsation of the heart and arteries has been regarded as an infallible means of deciding; but it is clearly ascertained,

that a person may live many hours without our being able to discover the slightest movement whatever, either of the heart or arteries. Hence, this is one of the signs least to be depended on.

7th. It has been considered that the individual was dead when respiration had ceased; and to assure one-self of the existence of this function, a variety of means have been suggested; among others, that of holding a lighted taper, or other substance, to the mouth and nostrils; and it has been presumed, that the person was dead if the flame was not agitated. Others have formed the same conclusion, when a mirror placed before the mouth was not tarnished; lastly, it has been advised to place a vessel of water upon the pit of the stomach, and if the water had no motion it was considered that life was extinct: but experience proves that none of these signs are sufficient to establish the reality of death.

8th. It has been thought that an individual was dead when he was cold: there is, perhaps, no sign so little decisive; for

many individuals who have been reduced to a state of apparent death, from submersion, &c. and restored to animation, were found very cold; while, under other circumstances, the heat remains a long time after death has taken place.

9th. The incisions, burns, blisters, and cupping-glasses, sometimes employed to prove the certainty of death, ought to be considered only as secondary means, since experience proves that so great a degree of insensibility exists in some diseases, that no pain has been felt even three or four days after their application. We ought to regard these tests only as valuable in as much as they furnish us with positive results; that is to say, when the persons supposed to be dead indicate pain from their application, and consequently give some signs of life: in the opposite case, we ought not to affirm that the individual is dead.

Conclusion.

It results from all that has been said:

1st. That no one of the signs, taken singly (except decided putrefaction) is sufficient to enable us to ascertain, positively, that an individual is dead.

2d. That death ought to be regarded as real when the whole of these signs are united.

BURNS.

Of superfical and slightly extended Burns.

117. The first thing to be done, is to plunge the part into very cold water, containing the extract of lead and quicklime, in the proportion of one drachm of lime and two tea-spoonfuls of the extract to a pint of water. This fluid should be changed from time to time, whenever it becomes hot; and the burnt part ought to remain in it for several successive hours. When, by this means, the pain is considerably abated, remove the injured part from the local bath, and envelope it in compresses steeped in the same liquid, with which they should also be moistened from time to time. In defect of the ex-

tract of lead, lime-water, simple cold water, or still better, ice may be employed. If from the situation of the injured part it is impossible to take advantage of the local bath, it should be very frequently wetted, by the help of a sponge, with this fluid. Experience daily proves the efficacy of the remedy we are advising; it farther proves that it may be used, with the greatest success, a quarter or half an hour after the accident, and even when blisters have already risen.

When the irritation is diminished, so that the patient ceases to suffer, the blisters may be opened; but that must not be done till after the lapse of some days. Each blister should be pricked with a needle in one or two places, at its lowest part, and the serous matter allowed to flow out. There is inconvenience in not piercing them, as well as in doing so at too early a period. In the first case the serous matter, being accumulated, may occasion an ulcer; in the second case, the air would greatly irritate the surface of the wound and augment the pain.

All the parts deprived of the scarf-skin, ought to be dressed with a rag or piece of fine blotting-paper smeared with cerate; and then covered with compresses soaked in goulard-water.

The simple cerate may be replaced by the cerate made with Goulard's Extract, provided the sensibility of the part is much diminished: in the contrary case it may be hurtful, because the pain would be thereby increased.

When the pain is so intense as to render the bare pressure of the dressings insupportable; mix an equal part of lime-water and linseed, or olive-oil, and by means of a pencil, lightly smear the denuded part over with this liniment; the wound must be dressed twice a day.

It is necessary to make several little holes in the linen which immediately covers the wound, so as to allow the matter to ooze out.

118. If, notwithstanding the employment of the goulard, the inflammation should increase in the burnt part, a poultice must be applied. This should be

made of a decoction of mallow-root, and two or three poppy-heads; linseed-meal, or the crumb of bread being added, to give it the proper consistence.

Of superficial and extensive Burns.

119. When the burn is superficial and extended over a large surface, there is much danger, and death may be the consequence; the pains are intense, the inflammation considerable, and the fever very violent. Under such circumstances, bleeding must be performed once or twice; all food must be forbidden, except a little thin broth, linseed or mallow infusion, or sugar and water. The antispasmodic mixture, § 6., is also to be given.

Independently of these internal remedies, all the burnt parts must be dressed with cerate mixed with Goulard's Extract, if the pressure can be supported; however, if the pain be very violent, emollients, such as linseed, or mallow infusion, must be used.

When the burn has been occasioned by gun-powder, all the grains must be carefully removed.

Of severe Burns.

120. When the injury has penetrated very deep, and the part is very black, and edged with a circle more or less red, apply the emollient poultice, § 118., and the simple cerate; and wait until the eschar falls off. When parts of this eschar appear ready to fall off, they may be cut with a pair of scissars.

The ulcer which results from the separation of the gangrenous parts, must be treated as a simple wound; dressing it once or twice a day with dry lint, and abandoning all the unctuous matters the ancient surgeons made so much use of in these cases. It is only when cicatrization is nearly effected, that the edges should be dressed with cerate: by this means we prevent the adherence of the lint and consequent irritation of the wound, which would prevent the cicatrization.

OF ADULTERATED WINES.

121. WINES may be adulterated by a variety of substances. The object proposed to be accomplished by this fraud, is to mask some of their defects, and to give them colour, odour, or strength.

Among the substances employed, there are some, the use of which is attended with no danger; others, on the contrary, are more or less poisonous, and cannot be swallowed without giving rise to serious accidents, which may often be followed by death.

This consideration has induced us to state the methods by which it may be determined, whether the wine has been adulterated.

Wines adulterated by Lead.

Sugar of lead, cerusse, and still more frequently litharge, are mixed with acid or sharp tasted wines, in order to render them less so, and these substances do in fact give them a sweet taste. Of all

frauds this is the most dangerous. Persons who drink liquids adulterated with these preparations, suffer all the symptoms we have spoken of under the article Lead, § 53.

White Wines.

White wines adulterated by preparations of lead, present, independently of their saccharine astringent taste, many properties by which we may detect them.

1st. They redden but slightly the tincture of litmus, because the acid they naturally contain is saturated by the oxide of lead.

2d. Sulphuric acid (oil of vitriol) and the sulphates (or salts formed by the union of sulphuric acid), such as the sulphate of soda (Glauber's salts), sulphate of magnesia (Epsom salts), dissolved in pure water, and mixed with these wines, render them thick and muddy; in a short time a white precipitate is found at the bottom of the vessel in which the experiment is made. This deposit does not disappear upon the addition of water.

3d. Muriatic acid and the muriates, as muriate of soda (common salt), when dissolved in pure water, and added to adulterated wine, also occasion a heavy white precipitate, which may be dissolved in twenty-five or thirty times its weight of water.

4th. The sub-carbonates of soda, potash, and ammonia, act in the same manner. The white precipitate they throw down is insoluble in water, but is dissolved very readily by pure nitric acid.

5th. The chromic acid, and the chromate of potash occasion a precipitate of a very fine canary yellow colour.

6th. Sulphuretted hydrogen, and the hydro-sulphates, as liver of sulphur, turn white wines sophisticated with lead of a black colour, and at the end of a few minutes throw down a black deposit.

7th. If we collect upon a filter, and dry the precipitates obtained by the means just indicated, and if, after having mixed them with powdered charcoal and caustic potash, we expose them in a crucible to a red heat during half

an hour, we obtain a metallic button, easy to be known; 1st. by its deep blue colour; 2d. by the facility of marking it with the nail; 3d. by the quickness with which it is dissolved in aqua-fortis, forming thereby a liquid salt of a sweetish taste, and having the property of being precipitated of a white colour by the sulphates, the hydro-chlorates, and the carbonates.

8th. Pure potash, soda, and the volatile alkali mixed with these wines throw down a white precipitate.

9th. Evaporated in a capsule at a boiling heat, they leave a deposit, which being heated to redness with powdered charcoal, affords, at the end of thirty or forty minutes, metallic lead. This property is sufficient to prove the presence of lead in wines.

Red Wines.

Red wines when adulterated with preparations of lead, are never of so deep a colour as before the adulteration; they

are of a pale red. We may prove the existence of lead in red wines, by the help of the substances directed to be used for white wines.

It is however necessary to observe —

1st. That ammonia causes a dirty green-coloured precipitate, when mixed with red wines which contain lead; on the contrary, in white wines the precipitate is white.

2d. That the hydro-sulphates may lead us into error if we confine ourselves to the superficial examination of their action.

That these substances detect the presence of lead in *red* wines, by throwing down a black precipitate, is true; but the same substances, when mixed with the greater number of red wines, produce the same effect; they become dark, and finish by depositing flakes of a deep violet colour. It is necessary, then, when we wish to decide by means of the test furnished by the hydro-sulphates, to observe that the black precipitate they form, when mixed with *red* wines, indicates

the presence of lead, if, after having been dried upon a filter and calcined with potash and charcoal, it leaves a button of metallic lead.

Of Wines adulterated by Alum.

The object of this adulteration is to render the wines redder and less changeable; and to give them an astringent taste. The dangerous consequences of this fraud are generally known. Digestion becomes painful; vomiting from time to time, obstruction of the bowels, and piles, are the results of drinking wine thus adulterated.

It has been asserted that we might recognise wines adulterated by this substance, by their possessing the following properties which belong to alum:

1st. Their taste is acid, slightly saccharine and astringent.

2d. They redden, in some degree, the blue colour of litmus; because independently of the acid, which is natural to them, they contain the sulphuric

acid which is in combination with the alum.

3d. Ammonia mixed with them occasions a precipitate, which is not dissolved by an excess of alkali.

4th. A solution of caustic potash also renders them muddy, and occasions a precipitate; but this is re-dissolved by an addition of potash.

5th. The sub-carbonate of potash throws down a precipitate, but does not re-dissolve it by an excess.

6th. The acetate, nitrate, and muriate, of barytes, occasion an abundant white precipitate, insoluble in water and in pure nitric acid.

It is true that, in certain circumstances, wines containing alum possess the properties we have just detailed; but it is equally certain that some wines which do not contain an atom of this substance, present some of the properties here indicated. Further, there are other wines in which, notwithstanding the presence of alum, it is impossible to verify all the characteristics which have been stated,

because they contain other substances besides alum; whence we must conclude that these characteristics do not possess all the importance which some have been disposed to ascribe to them, and ought to be regarded, at most, but as secondary means of detection.

7th. Of all the methods proposed to discover the presence of alum in wine, the following appears to deserve the preference.

By evaporating several pints of wine we obtain a reddish mass, composed of alum, and the colouring matter, and tartar, which make a part of the wine. This mass being dissolved in a large quantity of water and made to boil with some charcoal of the linden-tree*, an almost colourless liquid is obtained. If the liquid be filtered, evaporated by a gentle heat, until a thin crust is formed upon the surface, and then set in a cool place, the tartar will crystallize, and the supernatant fluid will hold the alum in solution.

* Or any fresh-made charcoal.

This fluid ought to have a sweetish astringent taste, and throw down a white precipitate, upon the addition of ammonia, or caustic potash; that formed by this last body ought to be soluble by an excess of potash. A solution of barytes, its acetate or muriate, ought to render it thick and occasion a white precipitate, insoluble in water and nitric acid.

Wines adulterated with Chalk.

Some persons are in the habit of adding chalk or lime to red or white wine, having a disagreeable acidity, with a view of saturating the acetic, or tartaric acid; and they thus by the combination of the chalk or lime with the acid, destroy their sharp taste. Wines treated in this manner are really much safer, but they may give rise to disagreeable symptoms if they contain too great a quantity of the acetate of lime.

This fraud may be discovered by the following means:

1st. Evaporate a quantity of the wine in an open vessel, or if the spirit be desired, let it be distilled: when the fluid is reduced to the consistence of a syrup, add a few ounces of distilled water, agitate the mixture for ten or twelve minutes, and filter the liquid, which will be found to contain acetate of lime, formed by the acetic acid of the wine, and the lime or chalk which has been added. The tartar which the wine contained will not be dissolved, but will remain upon the filter.

2d. Add to the fluid some oxalate of ammonia, which will occasion a white or slightly coloured precipitate. This is oxalate of lime; if it be washed, dried, and calcined, decomposition will take place, and quicklime be found at the bottom of the crucible.

3d. Lime may also be known, by its being readily dissolved in water, by its changing the blue colour of violets to green, by its solution in pure water, being precipitated of a white colour by car-

bonic acid, and by its not suffering any other change apparent to the eye.*

Wines adulterated by Brandy.

It happens sometimes that brandy is added to weak wines. In other circumstances wine is made with a mixture of cyder or other spirituous liquor, and brandy; logwood, sandal-wood, or some other colouring matter being added.

These adulterations have no other inconvenience than that of producing

* It should, however, be recollected that the solution of lime in water, soon acquires, by exposure to the air, and especially if breathed upon, a thin pellicle on its surface, which gradually becomes opaque, as it becomes thicker, till it breaks, and subsides to the bottom of the liquid. Fresh pellicles are then formed at the surface, and are successively precipitated, as long as any lime is held in solution. These depositions consist of carbonate of lime, formed by the absorption of carbonic acid from the atmosphere by the lime, and which is nearly insoluble in water. The phenomenon now mentioned is very characteristic of lime-water; though the Author does not seem to have adverted to it.

intoxication more readily, and frequently occasioning great head-ach.

We may discover wine which has been rendered stronger by brandy, from the following circumstances.

1st. There will be an odour of spirit, much more penetrating than that of pure wine; in effect, pure wine contains only the spirit which is developed during the fermentation, and this is intimately mixed with the other component parts of the wine; while in wine to which brandy has been added, the spirit is in some sort free, and is sensible to the organs of smell.

2d. From the same cause, wine to which brandy has been added, is much hotter to the taste than pure wine.

3d. According to M. Remer, when wine containing brandy is distilled by a slow fire, and the receiver is often changed, we find that brandy is the first product received, and that it comes over even before the fluid boils; we then obtain water, and lastly alcohol or pure spirit of wine.

When we submit to the same process wines which do not contain brandy, we obtain water in the first receiver, then alcohol, and lastly water again. This test does not appear to us to be altogether satisfactory.

Of Means employed to give a Colour to Wines.

Old wines being in general of a deeper colour than new, we may readily conceive, that those who sell wine, endeavour frequently to give a deep colour to their new wines.

White Wines.

1st. Pale white wines are often exposed to the air, which renders their colour deeper. They are then termed, in technical language, rusty. This method is unattended with danger.

2d. The same may be said of the method which consists in colouring wine with sugar or sugar-candy.

3d. The colour of these wines is ren-

dered more yellow by the aid of sulphureous acid gas. This is effected by pouring the wine into a vessel in which sulphur has been previously burnt; this fraud is dangerous, if the acid be in sufficiently large quantity. Wine adulterated by this means has an odour similar to that of sulphur when burnt, which it loses if made to boil for ten or fifteen minutes.

4th. Pale wines are often coloured by myrtle berries, (vaccinum myrtillus) logwood chips, and other substances which have also the property of rendering them more astringent. This fraud is accompanied with no danger, and may be known by the difficulty experienced in removing from linen the spots produced by such wine.

Wines adulterated by sweet or astringent Substances.

1st. Sugar, raisins, or sweet wines, are sometimes added: this addition is free from danger.

2d. In certain circumstances, the extract of oak or willow bark, &c., is used to render the wines more astringent: this, also, is attended with no inconvenience.

Of Wines altered by some other Substances.

Wines may sometimes contain arsenic, copper, antimony, &c., and thus give rise to dreadful accidents. We do not believe such a fraud is ever attempted by the dealers in wine: but as these substances may be accidentally introduced, we think it necessary to point out the means of detecting these substances.

Wines containing Arsenic.

1st. A mixture of *ten* parts of wine and *one* of arsenic throws down a precipitate of a deep yellow colour upon the addition of sulphuretted hydrogen, — of dark blue by the ammoniacal sulphate of copper, — and of a white by nitrate of silver.

2d. A mixture of *ten* parts of wine and *seven* of arsenic, throws down a precipitate of a golden yellow by the addition of sulphuretted hydrogen, — of a green by the ammoniacal sulphate of copper, — of a white by the nitrate of silver.

3d. The best means of detecting the presence of arsenic is to collect the yellow precipitate occasioned by the sulphuretted hydrogen, and heating it in a long narrow tube of glass, with equal parts of caustic potash and charcoal; a few minutes' exposure to a red heat suffices to volatilize the arsenic, which is found adhering to the upper part of the tube in small flakes, brilliant like steel, and which, placed upon burning coals, diffuse the odour of garlic.

Wines containing the Salts of Antimony.

1st. Antimonial wine evaporated in a porcelain cup, and calcined with charcoal and caustic potash, will leave a metallic button, known to be antimony

by the properties detailed in paragraph 29.

2d. It suffers no precipitation by the addition of water.

3d. It throws down a deep red precipitate by the addition of sulphuretted potash, that is, provided the quantity of sulphuretted potash be not very large; in which case the precipitate is black.

4th. Oil of vitriol occasions a precipitate of a deep yellow colour, which borders slightly upon a grey.

5th. A spiritous infusion of gall-nuts throws down a dirty white precipitate. It sometimes happens that red wines which contain tartar emetic throw down a reddish yellow or green precipitate by the addition of sulphuretted potash, — a deep violet by sulphuric acid, — and a clear violet by an infusion of gall-nuts. Hence we may conclude, that to assure ourselves of the presence of antimony, it is necessary to calcine the precipitate with charcoal and caustic potash, and thus obtain metallic antimony.

Of Wines containing a Salt of Copper.

1st. A mixture of ten parts of wine and one of a concentrated solution of verdigris throws down a precipitate of a black colour by the addition of either sulphuretted potash, soda, or ammonia, — of a chesnut colour by the prussiate of potash, — and of a dark grey by ammonia. This last precipitate cannot be dissolved entirely by an excess of alkali, and the supernatant liquor is never blue.

2d. The same quantity of wine united to seven parts of a solution of verdigris occasions analogous precipitates, excepting that the precipitate caused by ammonia is black.

3d. The best means of being assured of the presence of copper in wine, is to calcine the precipitate obtained by the means above directed, with charcoal and caustic potash. By exposure to heat for about half an hour, metallic copper, which is easily known by its colour, will be obtained.

APPENDIX.

ON ASPHYXIA.

"From considering," Dr. Curry observes, "that a drowned person is surrounded with water instead of air, and that in this situation he makes strong and repeated efforts to breathe, we should expect that water would enter, and completely fill the lungs. This opinion, indeed, was once very general, and it still continues to prevail among the common people. Experience however has shown, that unless the body lie so long in the water as to have its living principle entirely destroyed, the quantity of fluid present in the lungs is inconsiderable; and it would seem that some of this is the natural moisture of the part accumulated; for, upon drowning kittens, puppies, &c. in ink, or other coloured liquors, and afterwards examining the lungs, it is found that very little of the coloured fluid has found admittance into them.

"To explain the reason why the lungs of drowned animals is so free from water, it is necessary to observe, that the muscles which form the opening into the windpipe, are exquisitely sensible, and contract violently upon the least irritation; as we frequently experience when any part of the food or drink happens to touch them. In the efforts made by a drowning person, or animal, to draw in air, the water rushes into the mouth and throat, and is applied to these muscles, which immediately contract in such a manner as to shut up the passage to the lungs. This contracted state continues as long as the muscles retain the principles of life, upon which the power of muscular contraction depends; when that is gone, they become relaxed, and the water enters the windpipe, and completely fills it. On dissecting the body of a recently drowned animal, no particular fulness of the vessels within the skull, nor any disease of the brain or its membranes is visible. The lungs also are sound, and the branches of the windpipe generally contain more or less of a frothy matter, consisting chiefly of air, mixed with a small quantity of colourless fluid. The external blood-vessels are empty, and the fleshy parts are as pale as if the animal had been bled to death.

"When the body has lain in the water for

some time, other appearances will also be observable; such as, the skin livid, the eyes blood-shot, and the countenance bloated and swollen; but these appearances, though certainly unfavourable, do not absolutely prove that life is irrecoverably gone. It is now known, that in cases of drowning, no injury is done to any of the parts essential to life; but that the RIGHT cavity of the heart*, together with the veins and arteries leading to and from that cavity, are turgid with blood, whilst every other part is drained of this fluid. The practice of holding up the bodies of drowned persons by the heels, or rolling them over a cask, is unnecessary; the lungs not being filled with any thing that can be evacuated in this way. Therefore, such a practice is highly dangerous, as the violence attending it, may readily burst some of those vessels which are already overcharged with blood; and thus convert what was only suspended animation, into absolute and permanent death."

* The blood is returned iuto the *right* side of the heart by the veins; from the right side it is propelled through the pulmonary artery to circulate through, and undergo a change in the lungs. Having undergone this change in the lungs, it is brought to the left side of the heart. The left ventricle, when distended, contracts and throws the blood through the aorta, or great artery, to every part of the body.

HANGING.

" In hanging, the external veins of the neck are compressed by the cord, and the return of the blood from the head thereby impeded, from the moment that suspension takes place; but as the heart continues to act for a few seconds after the wind-pipe is closed, the blood which is sent to the head, during this interval, is necessarily accumulated there. Hence it is, that in hanged persons, the face is greatly swollen, and of a dark-red or purple colour; the eyes are commonly suffused with blood, enlarged and prominent. On dissection, the blood vessels are considerably distended; but, in general, no further marks of disease appear within the skull. The lungs are generally found quite collapsed, and free from frothy matter. The heart and large vessels adjoining it, exhibit the same appearances as in the bodies of drowned persons. From the great accumulation of blood in the vessels of the head, many have been of opinion, that hanging chiefly kills by inducing apoplexy; but the following experiment made at Edinburgh several years ago, by an eminent medical professor there, clearly proves, that in hanging, as well as drowning, the exclusion of air from the lungs is the immediate cause of death. A dog was suspended by the neck by a cord, an

opening having been previously made in the wind-pipe, below the place where the cord was applied, so as to admit air into the lungs. In this state he was allowed to hang for three quarters of an hour, during which time the circulation and breathing went on. He was then cut down, without appearing to have suffered much from the experiment. The cord was now shifted below the opening into the wind-pipe, so as to prevent the ingress of air into the lungs; and the animal being again suspended, he was completely dead in a few minutes. Upon the whole, then, it appears, that the same measures recommended for drowned persons, are also necessary here; with this addition, that opening the jugular veins, or applying cupping glasses to the neck, will tend considerably to facilitate the restoration of life, by lessening the quantity of blood contained in the vessels of the head, and thereby taking off the pressure from the brain. Except in persons who are very full of blood, the quantity taken away needs seldom exceed an ordinary tea-cup full, which will in general be sufficient to unload the vessels of the head, without weakening the powers of life."

Causes of Death and Recovery.

"THE persons immersed in water cannot inspire. Expiration, in a small degree, for a

short time is continued. The blood neither circulates through the lungs, nor is changed by the influence of air. The nervous system not being stimulated, the organs of the body lose their sensibility. By the inflation of the lungs they are distended and supplied with air; the blood is moved through them and influenced. Electricity excites the contraction of the heart. Heat and sensibility being in some degree restored, stimulants bring the languid powers into action." — Annual Report of the Royal Humane Society, 1818, page 29.

DIRECTIONS FOR THE TREATMENT OF PERSONS APPARENTLY DEAD.

"THESE directions have engaged the attention of the Royal Humane Society from its commencement, being essentially requisite to effect the purpose for which it was instituted.

"It is, however, to be recollected, that these directions are addressed chiefly to persons not of the medical profession; so that should any of our readers, (prompted either by a laudable wish to gratify curiosity, or by a desire to become an efficient assistant in these cases of distressing emergency,) be anxious to obtain more knowledge than can on this occasion be communicated, we refer them to authors

eminent for ability, and illustrious for humanity; we need only mention the names of Hawes, Kite, Coleman, Struve, Curry, Fothergill, and Lettsom.

"The order to be observed in the use of the various means and steps of the resuscitative process must be adapted to the particular circumstances of an individual case. The medical man must exercise his judgment. The humane assistant, not of the medical profession, should be careful to do only that which the extent of his knowledge will enable him to undertake with confidence.

"The heat of the body is soon reduced to the temperature of the surrounding medium, after respiration and circulation of the blood has ceased.

"We breathe easily with the mouth shut; not so if the nostrils be closed. The mouth leads to the stomach; the nostrils to the lungs. It is of great importance to keep these openings free from every kind of obstruction."

Artificial Respiration.

"To accomplish this very important part of the process in an effectual manner, some pains must be taken to obtain a knowledge of the instruments, and of those parts of the body to which they are to be applied. If a case of

instruments be not at hand, we must have recourse to such substitutes as can be obtained, and employ them until better can be procured; for early inflation of the lungs is a remedy of the first importance. The substitutes are, a pair of common bellows, and the box-wood tube, or wine-strainer or horn, or conical tube of stiff paper, &c." — *Vide* Observations on Apparent Death from Drowning, &c., by Dr. Curry.

Modes of Inflation.

"While an assistant sustains the tube fitted accurately in one nostril, and stops the other nostril with his left hand, and with his right accurately closes the mouth, another assistant, (who ought to be placed on the opposite side, or left hand of the body,) is, with his right hand to press backwards, and draw gently downwards towards the chest the upper part of the wind-pipe, that part which lies a little below the chin, and which, from its prominence in men, is vulgarly called Adam's apple; by doing this, the gullet or passage into the stomach will be completely stopped up, whilst the wind-pipe will be rendered more open, to let the air pass freely into the lungs. The left hand of this second assistant is to be spread lightly over the pit of the stomach, ready to compress the chest, and expel the air again as soon as the

lungs have been quite filled; the first assistant unstopping the mouth or nostril at the same time, to let the air escape. The same operation is to be repeated in a regular and steady manner, either until natural respiration begins, or until this and the other measures recommended have been persisted in for at least *six hours*, without any appearance of returning life.*

"If after having cleared the throat from froth and mucus, this mode does not succeed, recourse must be had to the following; which, however, requires the use of the instruments of the Society.

"The subject being placed in as advantageous a situation as circumstances will permit, the bellows should be applied to one nostril, whilst the other nostril and the mouth are kept closed, and the lower end of the prominent part of the wind-pipe is pressed backward and a little downward. The bellows is to be worked in this situation; and when the breast is swelled by it, the bellows should stop, and an assistant should press the chest in the direction upwards to expel the air. The bellows should then be applied as before, and the chest again pressed; this process should be repeated from fifteen to

* Dr. Curry's Work, p. 49.

twenty times in a minute, so as to imitate natural breathing as nearly as possible. As the trachea (wind-pipe) is always open through the glottis, (the opening of the larynx at the bottom of the tongue,) air conveyed through the mouth, the nostrils being closed, would necessarily pass into the lungs, if the cartilages of the larynx (a cartilaginous cavity, situated behind the tongue) be pressed against the vertebræ, (bones of the neck,) *which they ought always* to be, so as to close the æsophagus, (gullet,) and prevent the passage of the air into the stomach, and at the same time the mouth and left nostril be closed, and the pipe of the bellows inserted into the right nostril, the air will pass into the lungs through the wind-pipe, because that is the only opening through which it can pass; its passage into the æsophagus, or its egress through the mouth or left nostril, being prevented in the manner above described."

Electricity.

"THIS stimulant is employed to excite contraction of the heart, and to cause the blood to pass through the lungs. The latter cannot be accomplished, but when the lungs are expanded, and is assisted by their subsequent subsidence. Every contraction of the heart excited by too powerful a stimulant, and at an improper time,

lessens the same remains of vital power. The Society recommends the non-medical assistant to obtain his knowledge of this very important means from medical authors. Moderate shocks, cautiously, and gradually increased, passed through the chest in different directions, are attended with the best effects. There are reasons which seem to lead to the preference of a voltaic trough to an electrical machine. Electricity or galvanism should be tried, when inflation and the other means recommended, have been assiduously employed for an hour or more without any appearance of returning life; this interval will probably allow time for the arrival of a medical assistant. It is the opinion of some medical practitioners, that electricity should be resorted to whilst the lungs are being inflated." — Royal Humane Society's Report, for 1818, p. 23. *et seq.*

Management after Recovery.

" The greatest posssible care is required to maintain the restored actions; so as on the one hand to avoid excitement, or on the other to prevent their cessation. If suicide has been attempted, and thus happily prevented, we cannot but impress the necessity of the most guarded conduct. This part will most likely devolve entirely on the medical practitioner."— *Ibid.*

PREVENTION OF THE EFFECTS OF LIGHTNING.

"When persons happen to be overtaken by a storm, although they may not be terrified by the lightning, yet they naturally wish for shelter from the rain which usually attends it; and therefore, if no house be at hand, generally take refuge under the nearest tree they can find. But, in doing this, they unknowingly expose themselves to a double danger; first, because their clothes being thus kept dry, their bodies are rendered more liable to injury, the lightning often passing harmless over a body, the surface of which is wet; and secondly, because a tree, or any elevated object, instead of warding off, serves to attract and conduct the lightning, which, in its passage to the ground, frequently rends the trunks and branches, and kills any person or animal who happens to be close to it at the time. Instead of seeking protection, then, by retiring under the shelter of a tree, hay-rick, pillar, wall, or hedge, the person should either pursue his way to the nearest house, or get to a part of the road or field which has no high objects that can draw the lightning towards it, and remain there until the storm has subsided.

"It is particularly dangerous to stand near leaden spouts, iron gates, or palisadoes, at such

times; metals of all kinds have so strong an attraction for lightning, as frequently to draw it out of the course it would otherwise have taken.

" When in a house, avoid sitting or standing near the window, door, or walls, during a thunder-gust. The nearer you are placed to the middle of the room, the better.

" The greatest danger to be apprehended from lightning is the explosion of powder-magazines, which might, in a great degree, be secured from danger by insulation, or by lining the bulk-heads and floorings with materials of a non-conducting nature, the expence of which would not be great.

" When a person is struck by lightning, strip the body, and throw buckets-full of water over it for ten or fifteen minutes; let continued frictions and inflations of the lungs be practised; let gentle shocks of electricity be made to pass through the chest, when a skilful person can be procured to apply it; and apply blisters to the breast.

" Dr. Curry very earnestly advises the use of electricity in these cases of apparent *death. ' This recommendation,' he adds, ' does not

* Vide Dr. Curry's Observations on Apparent Death, &c. p. 95.

depend upon mere theory, but is drawn from instances of its success in real cases, as well as in experiments made upon fowls and other small animals, which, after being completely deprived of sense and motion by a *strong* electrical shock passed through the head or chest, were recovered by transmitting slighter shocks through the same parts: and in this way animation has been suspended and restored alternately for a considerable number of times. Besides, persons seemingly killed by lightning have frequently been restored by the ordinary means used in cases of apparent death; and from the superior stimulant power of electricity, there is every reason to think that it would have been successful in many cases where these alone have failed.' " *

PREVENTION OF THE FATAL EFFECTS OF DRINKING COLD WATER OR COLD LIQUORS OF ANY KIND, IN WARM WEATHER, OR WHEN HEATED BY EXERCISE OR OTHERWISE.

" AVOID drinking while warm, or drink only a small quantity at once, and let it remain a short time in the mouth before swallowing it; or wash the hands and face, and rinse the mouth

* Annual Report of the Royal Humane Society for 1818, p. 33—35.

with cold water before drinking. If these precautions have been neglected, and the disorder incident to drinking cold water has been produced, the first, and in most instances, the only remedy to be administered, is sixty drops of liquid laudanum in spirit or water, or warm drink of any kind.

" If this should fail of giving relief, the same quantity may be given twenty minutes afterwards.

" When laudanum cannot be obtained, rum and water, or warm water, should be given. Vomits and bleeding should not be used without consulting a physician." *

PREVENTION OF THE FATAL EFFECTS OF EXCESSIVE COLD.

" Persons are in danger of being destroyed by it when they become very drowsy, and are affected by general numbness or insensibility of the body. As the cold which proves fatal generally affects the feet first, great care should be taken to keep them as warm as possible, by protecting them, when they are exposed to cold, with wool, or woollen socks within the shoes or boots, or with large woollen stockings drawn

* Annual Report of the Royal Humane Society for 1818, p. 36.

over them, or, when riding, with hay or straw wrapped round them; by keeping up a brisk circulation in the blood-vessels of the feet, which will be best preserved by avoiding tight boots or shoes, *by moving the feet constantly*; or, when this is impracticable from a confined situation, and two or more persons are exposed together, by placing their feet, *without shoes*, against each other's breasts.

"Where the cold has produced apparent death, the body should be placed in a room without a fire, and rubbed steadily with snow, or cloths wet with cold water, at the same time that the bellows are applied to the nose, and used as in the case of drowning. This treatment should be continued a long time, although no signs of life appear; for some persons have recovered, who appeared lifeless for several hours.

"When the limbs only are affected by the cold, they should be rubbed gently with snow, or bathed in cold water with ice in it, until the feeling and power of motion return; after which, the bathing, or the rubbing with snow, is to be repeated once every hour, and continued a longer or shorter time as the pains are more or less violent." *

* Annual Report of the Royal Humane Society for 1818, p. 37.

PREVENTION OF THE DANGEROUS EFFECTS OF NOXIOUS VAPOURS FROM WELLS, CELLARS, FERMENTING LIQUORS, &c.

"PROCURE a free circulation of air, either by ventilators, or opening the doors and windows where it is confined, or by changing the air, by keeping fires in the infected place, or by throwing in stone-lime recently powdered.

"Before any person descends in any well or vault, whether it has been closed any time or not, it is right to try whether the air be such that a person can breathe in it. This is to be done by letting a *lighted candle* slowly down, as where a candle will burn, there a man can breathe; and if the candle goes out, no one must venture down till the well be cleared; and the place at which the candle goes out will show the height to which the foul air reaches. This air is what is called by chymists *carbonic acid air*, being the same as that which proceeds from *burning charcoal*, and from *brewing vats*. Some soils make this more than others, especially a blue gault. This air being heavier than the common air, sinks to the bottom, and must be drawn out. To effect this, the following methods have been recommended.

" 1st. By a pair of bellows with a long tube or pipe fixed to the hole *underneath*, and which should extend almost to the surface of the water, or to the bottom of the well, if there be no water. By working these, the foul air will be drawn up, and fresh air will descend of itself into the well. The blacksmith's bellows, being the largest, would be the best, which might be slung to the frame-work over the well; and, in many places, a leathern engine-pipe is to be had, which might be fastened to the hole underneath.

" 2d. If these cannot be obtained, the air might be *baled out by the bucket*, letting it down just at the top of the water, but not dropping it in; and then drawing it up and emptying it on one side. The air in this bucket may be tried from time to time by putting a candle into it; but when the candle burns in that, it will not be safe for a person to go down without again letting down a candle into the well itself. This process would be tedious. But a large bucket might be constructed of coarse cloth, made in the shape of a bag, the lower end being fixed to a piece of wood, (the bottom of a tub or barrel of nearly the diameter of the well,) and the cloth might be made of any length, with a hoop at the top, and a string or line on each side of it. This being let down into the well, the bottom would rest on the water, and the whole of the

bag would fall on it; and as it was drawn up it would be filled with foul air, and would bale it out.

" 3d. A third mode might be, what is called on board a ship, a *wind-sail*, used for ventilating the cabin and *hold*. This is a sort of wide tube or funnel, made of canvass, with a rope running down the middle of it, and is kept open by hoops situated in different parts of its height. It is about two feet in diameter at the top, and tapers to about ten inches at the bottom. The top is hooded, and the upper part is open on one side, for perhaps six feet, which is above the deck, (or ground,) and is placed to windward, so as to receive the full current of the wind, which, on entering the opening, fills the tube, and, rushing down, drives up the foul air. In low places, sheltered from the wind, this might be blown into by the blacksmith's bellows, or by a winnowing fan; and where a well is not deep, and a pipe or wind-sail not at hand, blowing into the well with either the bellows or the winnowing fan might be sufficient. To persons whose business it is to go much into wells, &c., it would answer to keep a leathern tube to fix on to the bellows, or one of these wind-sails, for the purpose.

" 4th. A fourth mode might be, in wells, where there is a pump, *to pump water down into*

it for some time; when the water carrying a stream of fresh air along with it, and the pumping being kept up while the person was down, (and this stream might be directed by a trough or pipe, to that part where he did not want to work,) there would be a supply of fresh air for his breathing.

" 5th. Another method might be, to let down a bushel of quick-lime, and, dipping it into the water from time to time, to slack it, if there be water in the well; or, if not, by pouring water down upon it." *

METHOD OF RENDERING ASSISTANCE TO PERSONS IN DANGER OF DROWNING, SUGGESTED BY THE LATE DR. TAYLOR.

This desirable object appears attainable by the proper use of a man's hat and pocket-handkerchief, which (being all the apparatus necessary) is to be used thus: spread the handkerchief on the ground, and place a hat with the brim upwards, on the middle of the kandkerchief, and then tie the handkerchief round the hat as you would tie up a bundle, keeping the knots as near the centre of the opening as may be. Now by seizing the knots in one hand, and keeping the crown of the hat

* Annual Report of the Royal Humane Society for 1818, p. 39.

upwards, a person, without knowing how to swim, may fearlessly plunge into the water, with what may be necessary to save the life of a fellow-creature.

If a person should fall out of a boat, or the boat upset by going foul of a cable, &c., or should he fall off the quays, or indeed, fall into any water, from which he could not extricate himself, but must wait some little time for assistance, had the presence of mind to take off his hat, and hold it by the brim, placing his fingers within side the crown, and hold it so, (top downwards,) he would be able by this method, to keep his mouth well above water till assistance should reach him. It often happens, that danger is descried long before we are involved in peril, and time enough to prepare the above method; and a courageous person would, in seven instances out of ten, apply to them with success; and travellers, in fording rivers at unknown fords, or where shallows are deceitful, might make use of these methods with advantage.

INJURIOUS OR HAZARDOUS METHODS OF TREATMENT IN SUSPENDED ANIMATION.

" a. *Hanging by the Legs.*

" It has repeatedly been introduced into the Annual Reports for a series of years, that in suspended annimation from drowning, or from any other cause, hanging the subject by the heels, with the head down, is a most dangerous practice, calculated to extinguish the spark of life, if any remained, and consequently to exclude every prospect of recovery. This pernicious practice has been adopted from a mistaken principle, that drowning is induced by the water taken into the stomach or lungs, or both; but it has been ascertained by long experience, that death is occasioned by spasm on the glottis, trachea, or wind-pipe, causing suffocation, which stops the introduction of air into, and hence circulation of blood, through the lungs, and subsequently of the heart. Every person must have felt the sudden effect of almost stopping the breath, from the least drop of fluid or particle of matter, getting by swallowing or accident into the wind-pipe. Hence it must be obvious, that no quantity of water is admitted into the lungs in the act of drowning, and were it possible, suspension by the feet would not discharge the water, whilst it would increase the danger from spasm and

suffocation, as well as injure the functions of the brain, on which recovery materially depends. Nor is water taken into the stomach in drowning; the æsophagus, gullet, or passage into the stomach is a flaccid, soft, muscular tube, and its parietes or sides are always in contact, so that the passage is closed and never expanded, unless by the action of deglutition or swallowing as a function of life and health; and experiments prove, that no water is taken into the stomach in drowning, to occasion the suspension of life.

" b. For the same reasons, *rolling the body on the ground, a board, or cask, cannot produce any salutary effect*, unless what may be supposed to result from the motion of the body, which is, at the best, very doubtful, while time is lost by neglecting the means known to be really beneficial; for not a moment should be wasted in useless operations, under circumstances so critically alarming and dangerous."

" c. *Tobacco Smoke or Vapour.*

" It has long been the opinion of distinguished practitioners, that the fume of tobacco is narcotic and sedative, and hence, that its use is injurious in the torpid state of suspended animation; and many experiments have been adduced in confirmation. (Ph. Tr. for 1811, p. 1.)

" The action of tobacco in different preparations, is very singular. The empyreumatic oil, whether applied to the tongue or intestines, induces convulsions, difficulty of breathing, and death; the heart is found still acting; the brain is not affected externally; and the blood circulated is of a dark colour. The infusion of tobacco, however, acts in a manner wholly different; it produces, in the course of a few minutes, not insensibility, but retching and fainting, succeeded, at the end of some minutes more, by death; and on opening the thorax, the heart is found perfectly motionless and much distended. In one experiment, the cavities of one side of the heart contained dark-coloured blood, and those of the other, scarlet blood; a proof that the action of the heart had ceased even before the animal had ceased to expire. The infusion seems to act on the heart through the medium of the nervous system; and, in every point of view, is not admissible as a stimulant, in cases reduced to the debilitated state of apparent death."

" d. *Breathing into the Mouth.*

" It frequently happens, that when persons have been called to subjects under suspended animation, and where an apparatus is not at hand, they have endeavoured to promote the

action of the lungs by forcibly breathing through the mouth, at the same time stopping the nostrils, that the air may pass into the lungs of each subject; but as the air expired by the most healthy is not pure air, but chiefly carbonic, it is more likely to destroy than to promote the action of the lungs, and hence should be avoided. Mere pressure upon the thorax is infinitely preferable, till an apparatus can be procured, or even a common bellows, to convey atmospheric air into the lungs."

"e. *Salt or Spirits.*

"The practice of rubbing the body with salt or spirits is now justly condemned. The *salt* quickly frets the skin, and has, in some cases, produced sores, which were very painful and difficult to heal after recovery. *Spirits*, if used in this way, evaporate fast; and thereby, instead of *creating warmth*, as they are erroneously expected to do, *carry off a great deal of heat from the body.*" — See Curry's Observations, p. 57.—Report of the Royal Humane Society, for 1818, pp. 41—44.

TO PREVENT THE EFFECTS OF POISON OF LEAD ON PAINTERS, &c.

The physicians and surgeons of the Bath Hospital have ordered the following cautions

to be made public, to be observed by printers, compositors, plumbers, glaziers, painters, and other artificers, "to maintain the strictest temperance respecting spirits, which had better be altogether forborne. To pay the strictest attention to cleanliness, and never, when it can be avoided, to daub their hands with paint; never to eat their meals, or go to rest without washing their hands and face. Not to eat or drink in the room wherein they work, and much less to suffer any food or drink to remain exposed to the fumes or dust of the metal. As the clothes of persons in this line (painters particularly) are generally observed to be much soiled with the colours they use, it is recommended to them to perform their work in frocks of ticking, which may be frequently washed, and conveniently laid aside when the workmen go to their meals, and again put on when the workmen resume their work. Every business which can, in these branches, should be performed with gloves; woollen or worsted are recommended, as they may be often washed. Caution should be taken in mixing and even in unpacking, that the fine powders may not be drawn in by the breath. All artificers should avoid touching lead when hot; and this caution is particularly necessary for printers, or compositors, who have often lost the use of their

limbs, by handling the types, when drying by the fire, after being washed. Glaziers' putty should never be moulded by the hand — an iron pestle and mortar should be used."

ARSENIC.

By animals, which are capable of vomiting, Mr. Brodie affirms, that the greater portion of the arsenic swallowed, is commonly rejected, by spontaneous vomiting very soon after it has been taken; and whether the poison has been rejected spontaneously *, or in consequence of artificial sickness, a disease which is not found in cases of poisoning by vegetable narcotics, remains to be treated; namely, the inflammation of the stomach and bowels. In some cases, when a person has survived the immediate effects of arsenic as a poison, death has nevertheless ensued in a few days from the consequences of this inflammation; as in a case mentioned by Mr. Brodie, which occurred in

* Where the arsenic itself excites constant vomiting, no other remedy than mucilaginous liquids is required. When the poison has remained so long in the stomach that the sufferer lies insensible, racked with pain, and unable to swallow, recovery seems to be hopeless; in such cases, the most probable method of exciting vomiting is to lay some tartar emetic upon the tongue, part of which may perhaps be carried by the saliva into the stomach, and relieve it from the poisonous mineral.

St. Bartholomew's Hospital, and was related to him by Mr. Earle; in which extensive ulcerations were found in the mucous membrane of the stomach and bowels after death. In a similar case, which was treated by Dr. Roget, the patient, after having swallowed sixty grains of white arsenic, had vomited profusely, and probably discharged the whole of the poison, as the vomiting was assisted by copious dilution; it did not appear, indeed, from the analysis of the fluid, vomited at the time the patient was first seen by Dr. Roget, about sixteen hours after the poison had been taken, that any of it remained in the stomach. A severe train of symptoms, however, ensued, indicative of inflammation of the stomach and bowels, which demanded the use of the lancet, blisters, and other evacuants; and under this treatment the patient recovered. The recovery was slow, and various untoward symptoms occurred, such as an extension of the inflammation of the lungs and the spleen, and likewise several symptoms indicative of the disturbance of the sensorium, such as coma, dilated pupils, and even convulsions. — See Medico-Chirurg. Trans. vol. ii. p. 136.

THE END.

Printed by Strahan and Spottiswoode,
Printers-Street, London.